TENSAI
INTERNATIONAL

SERVICE MANUAL

TA-2650
TI-2600
TI-2610
TT-3645
TFL-812

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1. TA2650 (Stereo Integrated Amplifier)

1–1 SPECIFICATIONS

Rated Output Power
50 W continuous per channel, at 8 ohms from 20 to 20,000 Hz with no more than 0.1 % THD, both channels driven.

Total Harmonic Distortion
0.1 % at rated power
0.05 % at 1W/1 kHz

Input Sensitivity/Impedance

Phono :	2.5 mV/47 k ohms
Tuner :	150 mV/47 k ohms
Aux :	150 mV/47 k ohms
Tape:	150 mV/47 k ohms
Phono Maximum Input Level	200 mV
Output Level/Impedance	
TAPE:	150 mV/47 k ohms
Headphones :	8 ohms
Speakers :	A, B, A + B, OFF/8 ohms or more
Frequency Response	20–20,000 Hz +0/–1 dB
Tone Control Bass :	±9 dB/100 Hz
Treble :	±9 dB/10 kHz
Loudness Control	+8 dB/100 Hz, +4 dB/10 kHz
Subsonic Filter	–6 dB/15 Hz
Hi Filter	–6 dB/10 kHz
Signal - to - Noise Ratio	
Phono :	75 dB
Tuner, Aux, Tape :	85 dB
Power Consumption :	250W at rated power output
	28 W at no signal
Dimensions (WHD) :	430 × 80 × 250 mm
Weight :	6.5 kg

Our policy is one of continuous development of our products and we may change specifications without notice.

1–2 ALIGNMENT

TA-2650 PRE-MAIN AMPLIFIER ALIGNMENT PROCEDURES

A) OFF-SET VOLTAGE ALIGNMENT

1. Set a volume control at minimum position and also set tone controls (bass/treble) at centre positions.
2. Connect a speaker terminal + to the DC voltage meter + . Also connect a speaker terminal — to the DC voltage meter — .
3. Check the DC voltage to be at under plus/minus 50 mV.
4. When L channel is over +50 mV, cut a ADJ 1 jumper.
   When L channel is over –50 mV, cut a ADJ 2 jumper.
   When R channel is over +50 mV, cut a ADJ 3 jumper.
   When R channel is over –50 mV, cut a ADJ 4 jumper.

B) IDLING CURRENT CHECK

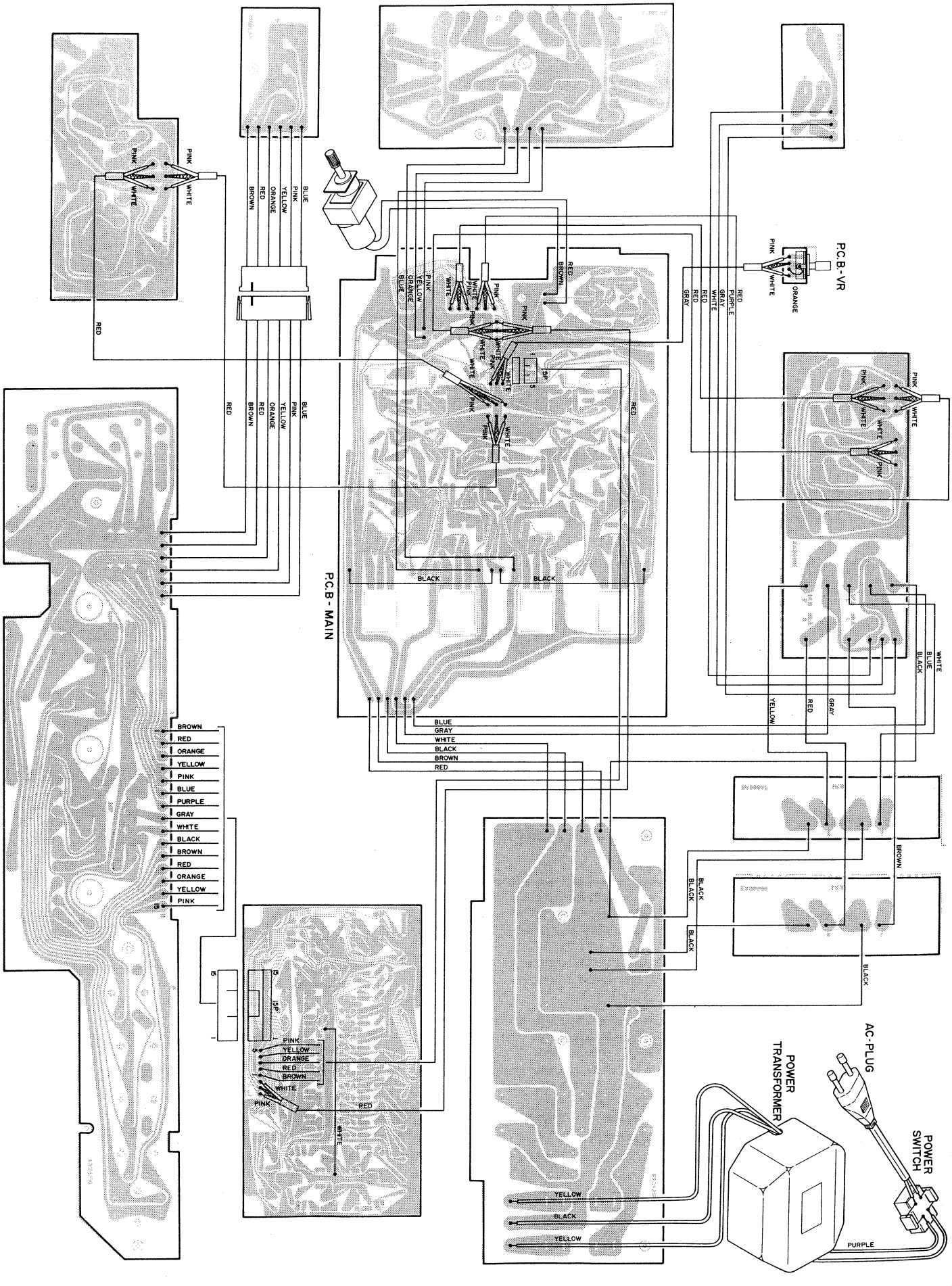
1. Set a volume control at minimum position and also set tone controls (bass/treble) at centre positions.
2. Connect TP1 of L channel to the DC voltage meter + .
   Connect TP2 of L channel to the DC voltage meter — .
   Connect TP4 of R channel to the DC voltage meter + .
   Connect TP3 of R channel to the DC voltage meter — .
   Then, check if DC voltage meter is at under 7 mV.
3. In case of over 7 mV, cut ADJ 5 jumper of L channel and also cut ADJ 6 jumper of R channel.

C) PROTECTION CIRCUIT ALIGNMENT

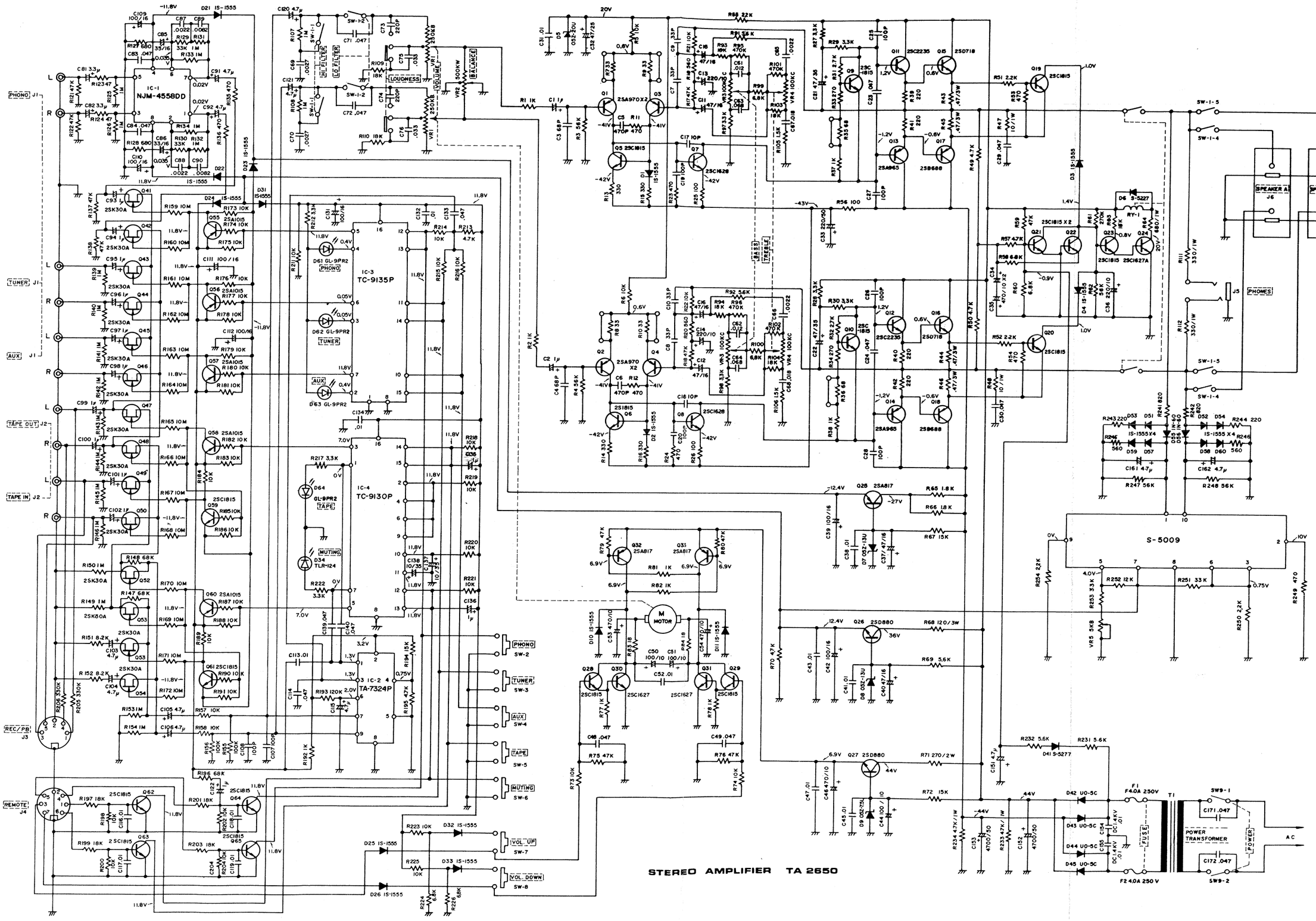
1. Check a protection relay to be cut off by giving plus/minus 2V to TP5 through centre voltage (output 0.6V).
2. Check a protection relay to be cut off by shorting speaker terminals + and — through giving over current (output 3V).

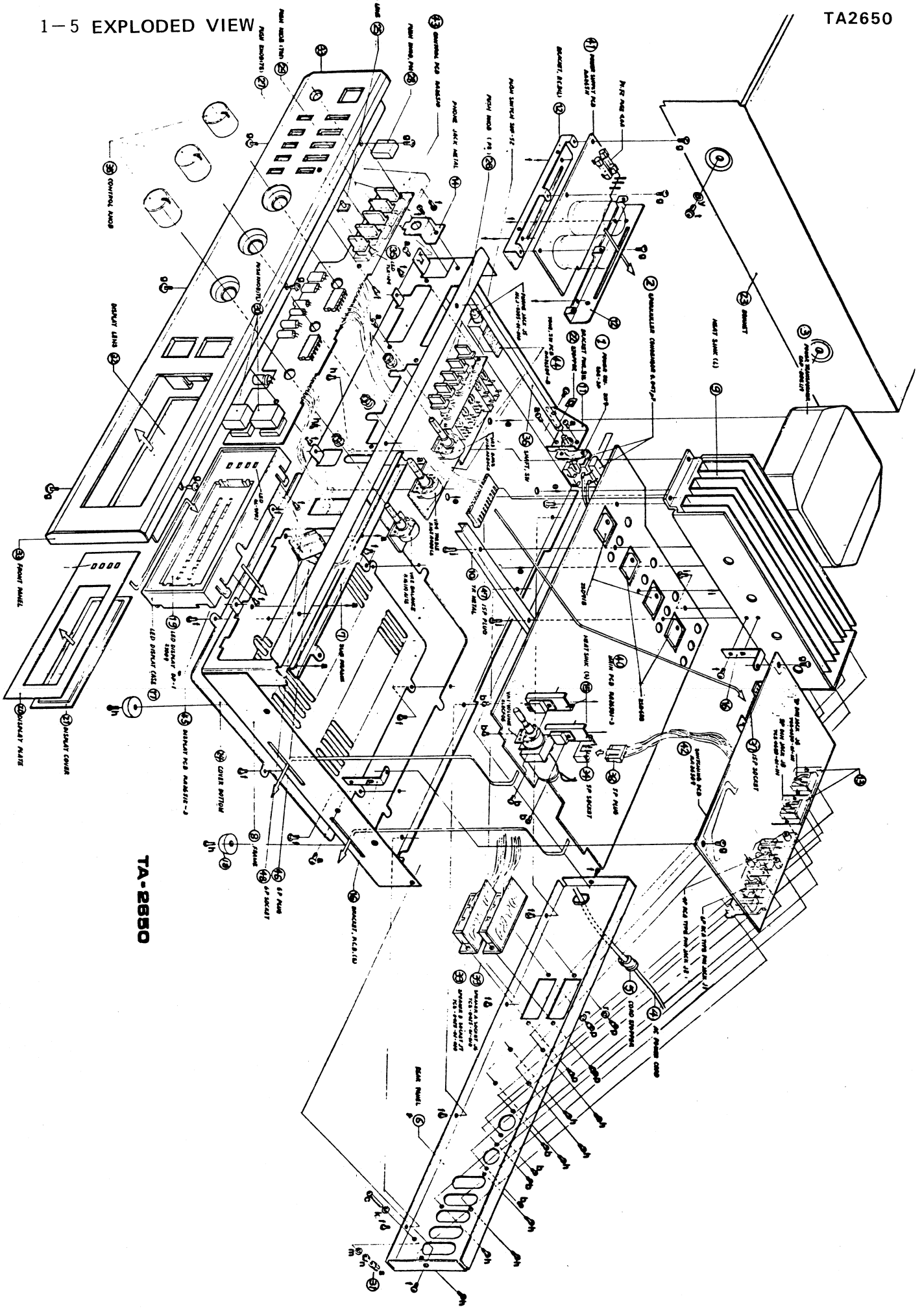
D) LEVEL INDICATOR ALIGNMENT (output load 8 ohm)

1. Give 1 KHZ signal to left and right channels through oscillator and set the output voltage at 17.9V.
   This time, turn up VR5 semi-fixed resistor to the right direction and confirm all LEDs light up.
2. Turn VR5 semi-fixed resistor to the left direction and stop turning when the right side LED (50W) goes out.

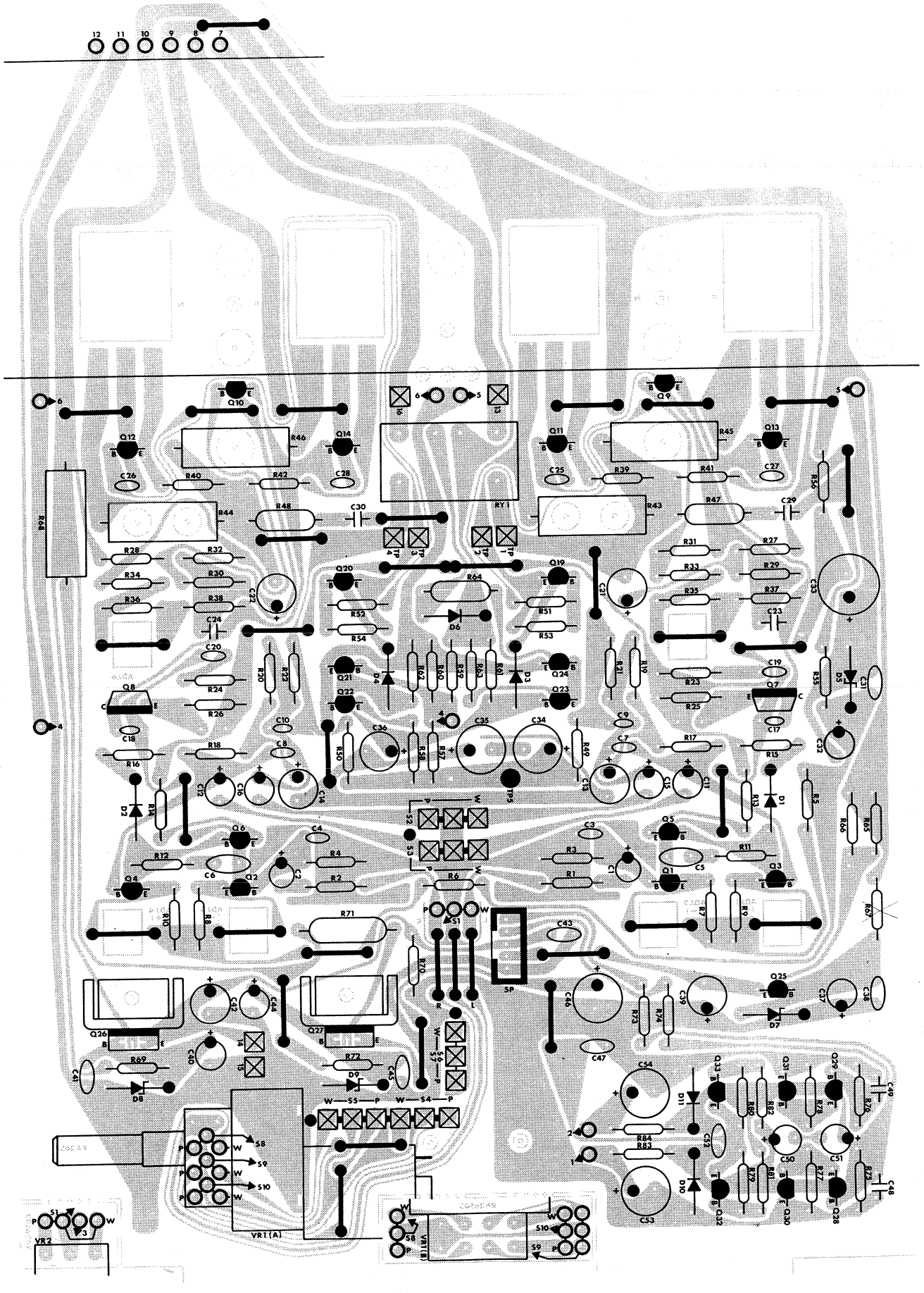

PC.B-VR
PC.B-MAIN
POWER TRANSFORMER
AC-PLUG
POWER SWITCH
PINK
WHITE
BLUE
YELLOW
ORANGE
RED
BROWN
GRAY
PURPLE
BLACK
ISP
BLUE
GRAY
WHITE
BLACK
BROWN
RED
YELLOW
BLACK
YELLOW
PURPLE

1—4 SCHEMATIC DIAGRAM

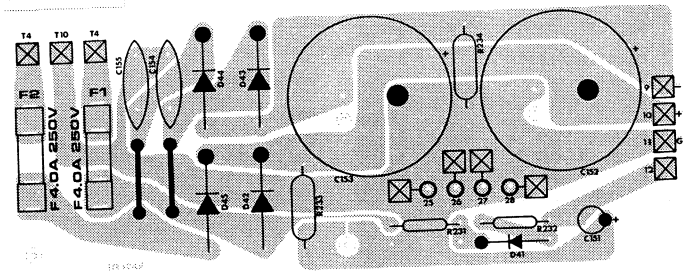



TA-2650

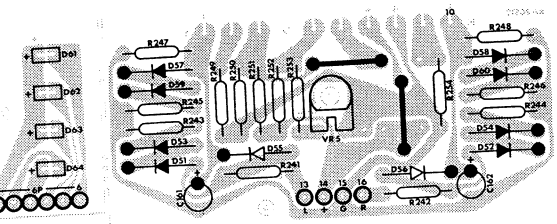
1−6 PRINTED CIRCUIT BOARDS

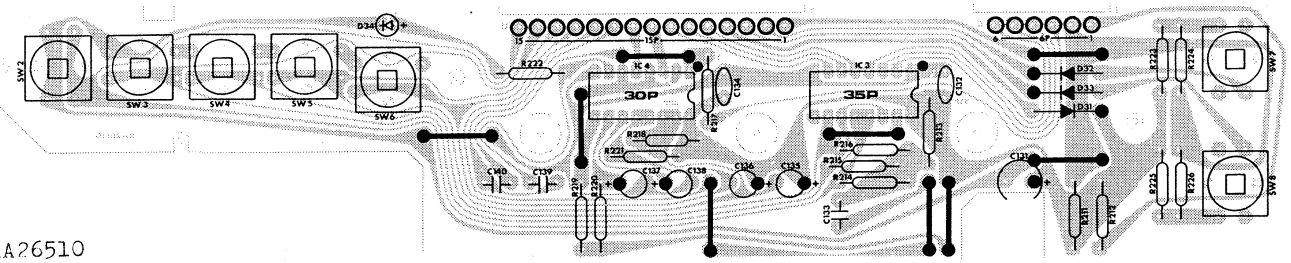


RA26511



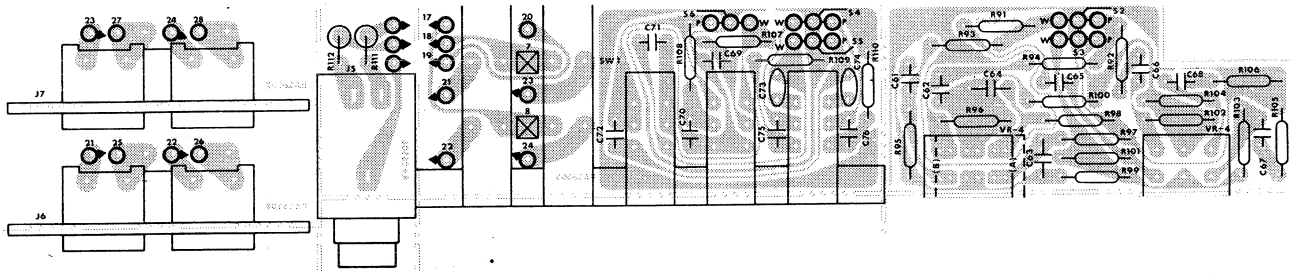
RA26512,26513

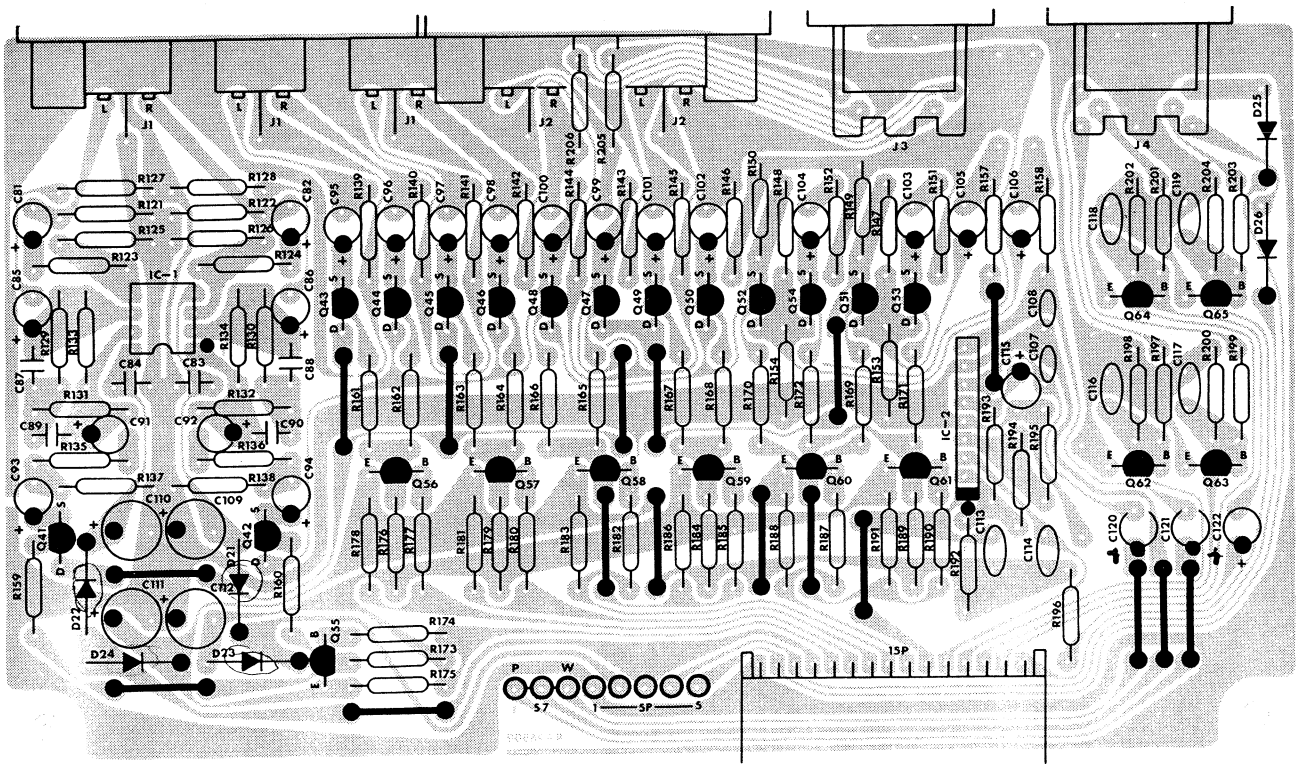




RA26510

RA26504, 26505, 26506, 26507, 26508





PARTS NO.	REF. NO.	DESCRIPTION		Q'TY
MAIN PCB SECTION				
265014		PCB RA-26501-3		1
		TRANSISTORS		
265001	Q15, 16	TR. 2SD-718	(O, Y)	2
265002	Q17, 18	TR. 2SB-688	(O, Y)	2
265003	Q11, 12	TR. 2SC-235	(O, Y)	2
265004	Q13, 14	TR. 2SA-965	(O, Y)	2
265005	Q7, 8	TR. 2SC-1628	(O, Y)	2
265006	Q1, 2, 3, 4	TR. 2SA-970	(GR, BL)	4
265007	Q5, 6, 9, 10, 19, 20, 21, 23, 28, 29	TR. 2SC-1815	(O, Y)	11
265008	Q24	TR. 2SC-1627A	(O, Y)	1
265009	Q25, 32, 33	TR. 2SA-817	(O, Y)	3
265010	Q30, 31	TR. 2SC-1627	(O, Y)	2
265011	Q26, 27	TR. 2SD-880	(O, Y)	2
		DIODES		
265023	D6	DIODE S-5277		1
265024	D1, 2, 3, 4, 10, 11	DIODE 1S-1555		6
265031	D5	ZENOR DIODE 05Z-20U		1
265032	D7, 8	ZENOR DIODE 05Z-13U		2
265033	D9	ZENOR DIODE 05Z-7.5L		1
		CAPACITORS		
265034	C34, 35, 46, 53, 54	ELECT. CAPACITOR 470μF 10V		5
265035	C33	ELECT. CAPACITOR 220μF 50V		1
265036	C13, 14, 36	ELECT. CAPACITOR 220μF 10V		3
265037	C39, 42	ELECT. CAPACITOR 100μF 16V		2
265038	C44, 50, 51	ELECT. CAPACITOR 100μF 10V		3
265039	C21, 22	ELECT. CAPACITOR 47μF 35V		2
265040	C32	ELECT. CAPACITOR 47μF 25V		1
265041	C11, 12, 15, 16, 37, 40	ELECT. CAPACITOR 47μF 16V		6
265042	C1, 2	ELECT. CAPACITOR 1μF 50V		2
265056	C23, 24, 29, 30, 48, 49	MYLAR CAPACITOR 0.047μF		6
265074	C31, 38, 41, 43, 45, 47, 52	CERAMIC CAPACITOR 0.01μF		7
265067	C5, 6	CERAMIC CAPACITOR 470PF		2
265068	C19, 20, 25, 26, 27, 28	CERAMIC CAPACITOR 100PF		6
265069	C3, 4	CERAMIC CAPACITOR 68PF		2
265070	C7, 8, 9, 10	CERAMIC CAPACITOR 33PF		4
265071	C17, 18	CERAMIC CAPACITOR 10PF		2
		RESISTORS		
265077	R68	RESISTOR 120Ω 3W		1
265078	R43, 44, 45, 46	RESISTOR 0.47Ω 3W		4
265079	R71	RESISTOR 270Ω 2W		1
265080	R64	RESISTOR 680Ω 1W		1
265081	R47, 48	RESISTOR 10Ω 1W		2
265082	R39, 40, 41, 42	RESISTOR 220Ω 1/4W		4
265083	R56	RESISTOR 100Ω 1/4W		1
265084	R61	RESISTOR S-25PL 270KΩ		1
265085	R3, 4, 62	RESISTOR S-25PL 56KΩ		3
265086	R17, 18, 59, 75, 76, 79, 80	RESISTOR S-25PL 47KΩ		7
265087	R63	RESISTOR S-25PL 18KΩ		1
265088	R67, 72	RESISTOR S-25PL 15KΩ		2
265089	R5, 6, 21, 22, 73, 74	RESISTOR S-25PL 10KΩ		6
265090	R58, 60	RESISTOR S-25PL 6.8KΩ		2
265091	R69	RESISTOR S-25PL 5.6KΩ		1
265092	R49, 50, 57, 70	RESISTOR S-25PL 4.7KΩ		4
265093	R27, 28, 29, 30	RESISTOR S-25PL 3.3KΩ		4
265094	R31, 32	RESISTOR S-25PL 2.7KΩ		2
265095	R51, 52, 55	RESISTOR S-25PL 2.2KΩ		3
265096	R65, 66	RESISTOR S-25PL 1.8KΩ		2
265097	R1, 2, 37, 38, 77, 78, 81, 82	RESISTOR S-25PL 1KΩ		8
265098	R11, 12, 23, 24, 53, 54	RESISTOR S-25PL 470Ω		6
265099	R13, 14, 15, 16	RESISTOR S-25PL 330Ω		4
265100	R33, 34	RESISTOR S-25PL 270Ω		2
265101	R25, 26	RESISTOR S-25PL 100Ω		2
265102	R35, 36	RESISTOR S-25PL 68Ω		2
265103	R7, 8, 9, 10	RESISTOR S-25PL 33Ω		4
265104	R83, 84	RESISTOR S-25PL 18Ω		2
265105	R19, 20	RESISTOR S-25PL 560Ω		2
265160	RY1	RELAY G2Z-222P-US		1
265147	VR1	VR. E1ECF06-250KBX2, VOLUME		1
265148	VR2	VR. K16110ATTE-500KW, BALANCE		1
265151	34	SOCKET S25-005, CONNECTOR		1
265152		HEAT SINK A-500D (SMALL)		2
265153		LAPPING PIN		11
265154		CONNECTOR PIN W/BASE 3P		2
265155		CONNECTOR PIN W/BASE 6P		1
265156		JUMPER LEAD 12.5 mm		34
265157		PIN FOR PCB MOUNTING		1
POWER PCB SECTION				
265015		PCB RA 26511		1
265025	D42, 43, 44, 45	DIODE UO-5C		4
265023	D41	DIODE S-5277		1
265043	C152, 153	ELECT. CAPACITOR 4700μF 50V		2
265044	C151	ELECT. CAPACITOR 4.7μF 50V		1
265074	C154, 155	CERAMIC CAPACITOR 0.01μF DC 1.4KV		2

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
265106	R233, 234	RESISTOR 4.7KΩ 1W	2
265107	R232	RESISTOR S-25PL 4.7KΩ	1
265108	R231	RESISTOR S-25PL 5.6KΩ	1
265149	F1, 2	FUSE F4.0A	2
265150		FUSE HOLDER 5φ	4
265156		JUMPER LEAD 12.5 m/m	2
265153		LAPPING PIN	11
CONTROL PCB SECTION			
265017		PCB RA-26510	1
265161	IC4	IC TC-9130P	1
265162	IC3	IC TC-9135P	1
265024	D31, 32, 33	DIODE 1S-1555	3
265163	D34	LED TLR-124	1
265037	C131	ELECT. CAPACITOR 100μF 16V	1
265046	C137, 138	ELECT. CAPACITOR 10μF 35V	2
265042	C135, 136	ELECT. CAPACITOR 1μF 50V	2
265056	C133, 139, 140	MYLAR CAPACITOR 0.047μF	3
265074	C132, 134	CERAMIC CAPACITOR 0.01μF	2
265109	R211, 214, 215, 216, 218, 219, 220, 221, 223, 225	RESISTOR S-25PL 10KΩ	10
265110	R224, 226	RESISTOR S-25PL 6.8KΩ	2
265111	R213	RESISTOR S-25PL 4.7KΩ	1
265112	R212, 217, 222	RESISTOR S-25PL 3.3KΩ	3
265164	SW2, 3, 4, 5, 6, 7, 8	TACT SWITCH KHC-10901	7
265165	46	CONNECTOR PLUG TA-2650-6P-A	1
265166	47	CONNECTOR PLUG TA-2650-15P-A	1
265156		JUMPER LEAD 12.5 mm	9
SWITCHING PCB SECTION			
265016		PCB RA-26509	1
265014	Q41, 42, 43, 44, 45, 46, 47, 48, 49 50, 51, 52, 53, 54	FET 2SK-30A (O, Y, GR) Transistor	14
265012	Q59, 61, 62, 63, 64, 65	TR 2SC-1815 (O, Y)	6
265013	Q55, 56, 57, 58, 60	TR 2SA-1015 (O, Y)	5
265024	D21, 22, 23, 24, 25, 26	DIODE 1S-1555	6
265168	IC-1	IC NJM 4558 DD	1
265169	IC-2	IC TA-7324P	1
265037	C109, 110, 111, 112	ELECT. CAPACITOR 100μF 16V	4
265049	C85, 86	ELECT. CAPACITOR 33μF 16V	2
265044	C91, 92, 103, 104, 105, 106, 115, 120, 121	ELECT. CAPACITOR 4.7μF 50V	9
265051	C81, 82	ELECT. CAPACITOR 3.3μF 50V	2
265042	C93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 122	ELECT. CAPACITOR 1μF 50V	11
265056	C83, 84	MYLAR CAPACITOR 0.047μF	2
265057	C89, 90	MYLAR CAPACITOR 0.0082μF	2
265058	C87, 88	MYLAR 0.0022μF	2
265074	C113, 114, 116, 117, 118, 119	CERAMIC 0.01μF	6
265068	C107, 108	CERAMIC 100PF	2
		RESISTORS	
265113	R159, 160, 161, 162, 163, 164, 165 166, 167, 168, 169, 170, 171, 172,	S-25PL 10KΩ	14
265114	R125, 126, 131, 132, 134, 139, 140, 141, 142, 143, 144, 145, 146, 149, 150, 153, 154	RESISTOR S-25PL 1KΩ	18
265115	R205, 206	RESISTOR S-25PL 330KΩ	2
265116	R193	RESISTOR S-25PL 120KΩ	1
265117	R155, 156	RESISTOR S-25PL 100KΩ	2
265118	R147, 148, 196	RESISTOR S-25PL 68KΩ	3
265119	R121, 122, 137, 138	RESISTOR S-25PL 47KΩ	4
265120	R129, 130	RESISTOR S-25PL 33KΩ	2
265121	R197, 199, 201, 203	RESISTOR S-25PL 18KΩ	4
265122	R194	RESISTOR S-25PL 15KΩ	1
265123	R173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 157, 184, 185, 186, 187, 188, 189, 190, 191, 198, 200, 202, 204	RESISTOR S-25PL 10KΩ	25
265124	R151, 152	RESISTOR S-25PL 8.2KΩ	2
265125	R195	RESISTOR S-25PL 4.7KΩ	1
265126	R192	RESISTOR S-25PL 1KΩ	1
265127	R135, 136	RESISTOR S-25PL 470Ω	2
265128	R123, 124	RESISTOR S-25PL 47Ω	2
265129	R127, 128	RESISTOR S-25PL 680Ω	2
265170	J1	6P RCA JACK	1
265171	J2	4P RCA JACK	1
265172	J3	5P DIN JACK TCS-4650-01-111	1
265173	J4	7P DIN JACK TCS-4670-01-111	1
265177	37	CONNECTOR SOCKET L25-015	1
265178	38	CONNECTOR PLUG TA-2650-5P-A	1
265156		JUMPER LEAD 12.5 mm	17

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
TONE SW PCB SECTION			
265018		PCB RA-26504-8	1
		CAPACITORS	
265059	C63, 64	MYLAR CAPACITOR 0.068μF	2
265056	C71, 72	MYLAR CAPACITOR 0.047μF	2
265061	C75, 76	MYLAR CAPACITOR 0.033μF	2
265062	C67, 68	MYLAR CAPACITOR 0.018μF	2
265063	C61, 62	MYLAR CAPACITOR 0.012μF	2
265064	C69, 70	MYLAR CAPACITOR 0.0027μF	2
265065	C65, 66	MYLAR CAPACITOR 0.0022μF	2
265076	C73, 74	CERAMIC CAPACITOR 220PF	2
		RESISTORS	
265130	R111, 112	RESISTOR 330Ω 1W	2
265131	R107, 108	RESISTOR S-25PL 1KΩ	2
265132	R95, 96, 101, 102	RESISTOR S-25PL 470KΩ	4
265133	R93, 94, 103, 104, 109, 110	RESISTOR S-25PL 18KΩ	6
265134	R99, 100	RESISTOR S-25PL 6.8KΩ	2
265135	R91, 92	RESISTOR S-25PL 5.6KΩ	2
265136	R97, 98	RESISTOR S-25PL 3.3KΩ	2
265137	R105, 106	RESISTOR S-25PL 1.5KΩ	2
265174	SW1	PUSH SWITCH SUF-52	1
265175	VR3, 4	TONE VR. K162A0B0CE-100KCx2	2
265176	J5	HEADPHONE JACK HLJ-0305-01-020	1

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
265153		LAPPING PIN	2
DISPLAY PCB SECTION			
265019		PCB RA-26512-13	1
265180	D91	DISPLAY LED S-5009	1
265181	D61, 62, 63, 64	LED GL-9PR2	4
265024	D51, 52, 53, 54, 57, 58, 59, 60	DIODE 1S-1555	8
265030	D55, 56	DIODE 1N-60	2
265053	C161, 162	ELECT. CAPACITOR 4.7μF 50V	2
265138	R247, 248	RESISTOR S-25PL 56KΩ	2
265139	R251	RESISTOR S-25PL 33KΩ	1
265140	R252	RESISTOR S-25PL 12KΩ	1
265141	R253	RESISTOR S-25PL 3.3KΩ	1
265142	R250, 254	RESISTOR S-25PL 2.2KΩ	2
265143	R241, 242	RESISTOR S-25PL 820Ω	2
265144	R245, 246	RESISTOR S-25PL 560Ω	2
265145	R249	RESISTOR S-25PL 470Ω	1
265146	R243, 244	RESISTOR S-25PL 220Ω	2
265182	VR5	SEMI-FIXED 5KB	1
265183		CONNECTOR SOCKET TA-2650-6P-B	1
265156		JUMPER LEAD 12.5 m/m	2

EXPLODED VIEW PARTS

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
265185	1	POWER SWITCH SDS-3P, SW9	1
265186	2	SPARKKILLER 0.047μF, C171, 172	2
265187	3	POWER TRANSFORMER, T1 CEP-80E119	1
265188	4	AC POWER CORD	1
265189	5	CORD STOPPER	1
265201	6	REAR PANEL	1
265202	7	CHASSIS MOUNTING BRACKET	1
265203	8	CHASSIS FLAME (A)	1
265204	9	HEAT SINK ASSY	1 set
265205	10	TR. BRACKET	1
265206	11	POWER SW MOUNTING BRAKCET	1
265235	12	PCB MOUNTING BRACKET	2
265207	13	SOCKET MOUNTING BRACKET	2
265208	14	H.D. FLAME	1
265209	15	HEAT SINK (SMALL)	2
265236	16	BRACKET, MAIN PCB	2
265210	17	LED CASE	1
265211	18	FOOT NO. 7102	4
265212	19	LED DISPLAY	1
265215	20	LED PLATE	1
265216	21	LED ACRYL	1
265237	22	STOPPER	1
265217	23	BONNET	1
265218	24	BOTTOM PLATE (A)	1
265219	25	LED GUIDE	1
265220	26	PUSH KNOB (A)	5
265221	27	PUSH KNOB (B)	1
265222	28	PUSH KNOB (E)	1
265223	29	PUSH KNOB (F)	4
265224	30	PUSH KNOB (G)	2
265225	31	DECORATION SCREW	1
265226	32	ACRYL, PANEL	1
265227	33	FRONT PANEL	1
265228	34	FRONT PANEL COVER	1

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
		MISCELLANEOUS	
265190		INSULATION TAPE	1
265191		LEAD WIRE	1 set
265192		SCREW	1 set
265193		BINDER, LEAD	6
265194		TUBE 1.5φ x 8 mm	8
265195		TUBE 1.0φ x 8 mm	26
265196		INDIVIDUAL CARTON BOX	1
265197		POLY BAG	1
265198		INSTRUCTION MANUAL	1
265199		TENSAI CERTIFICATE	1
265200		SNOW BOX	1 pair
265229	35	KNOB, BALANCE/TONE	3
265230	36	SHAFT, Power SW	1
265231	37	CONNECTOR SOCKET L25-015	1
265233	38	CONNECTOR PLUG 5P	1
265234	39	4P DIN SPEAKER SOCKET, J6, J7 TCS-0425-01-010	2
260514	40	PCB, RA-26501-3	1
260515	41	PCB, RA-26511	1
260516	42	PCB, RA-26509	1
260517	43	PCB, RA-26510	1
260518	44	PCB, RA-26504-8	1
260519	45	PCB, RA-26512-13	1
265165	46	CONNECTOR PLUG 6P	1
265166	47	CONNECTOR PLUG 15P	1
265183	48	CONNECTOR SOCKET 6P	1

2. TI2600 (Remote Control Receiver with Built in timer)

2—1 SPECIFICATIONS

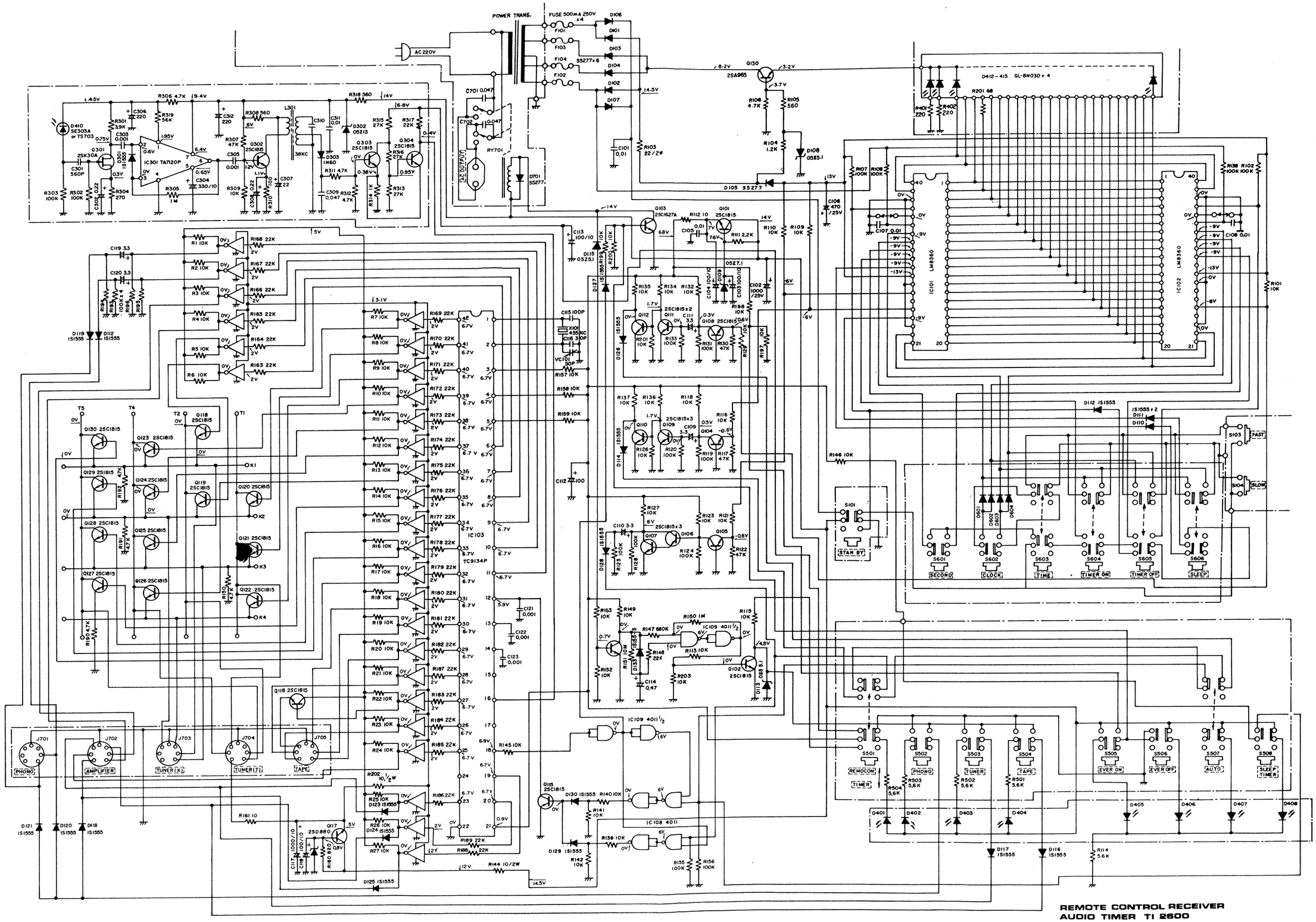
Clock	24 hours digital
Indication method	4 7-segment LEDs
Timer	Set by units of "minutes" for 24 hours
Timer accuracy	Monthly loss/gain: within 10 seconds
Auto-off, Aut-on	1 minute to 23 hours 59 minutes
Sleep timer	Set by units of "minutes" for 59 — 1 minute
AC outlet	550 VA
Power consumption	9W
Dimensions (W × H × D)	430 × 80 × 250 mm
Weight	3.8 kg

2—2 ALIGNMENT

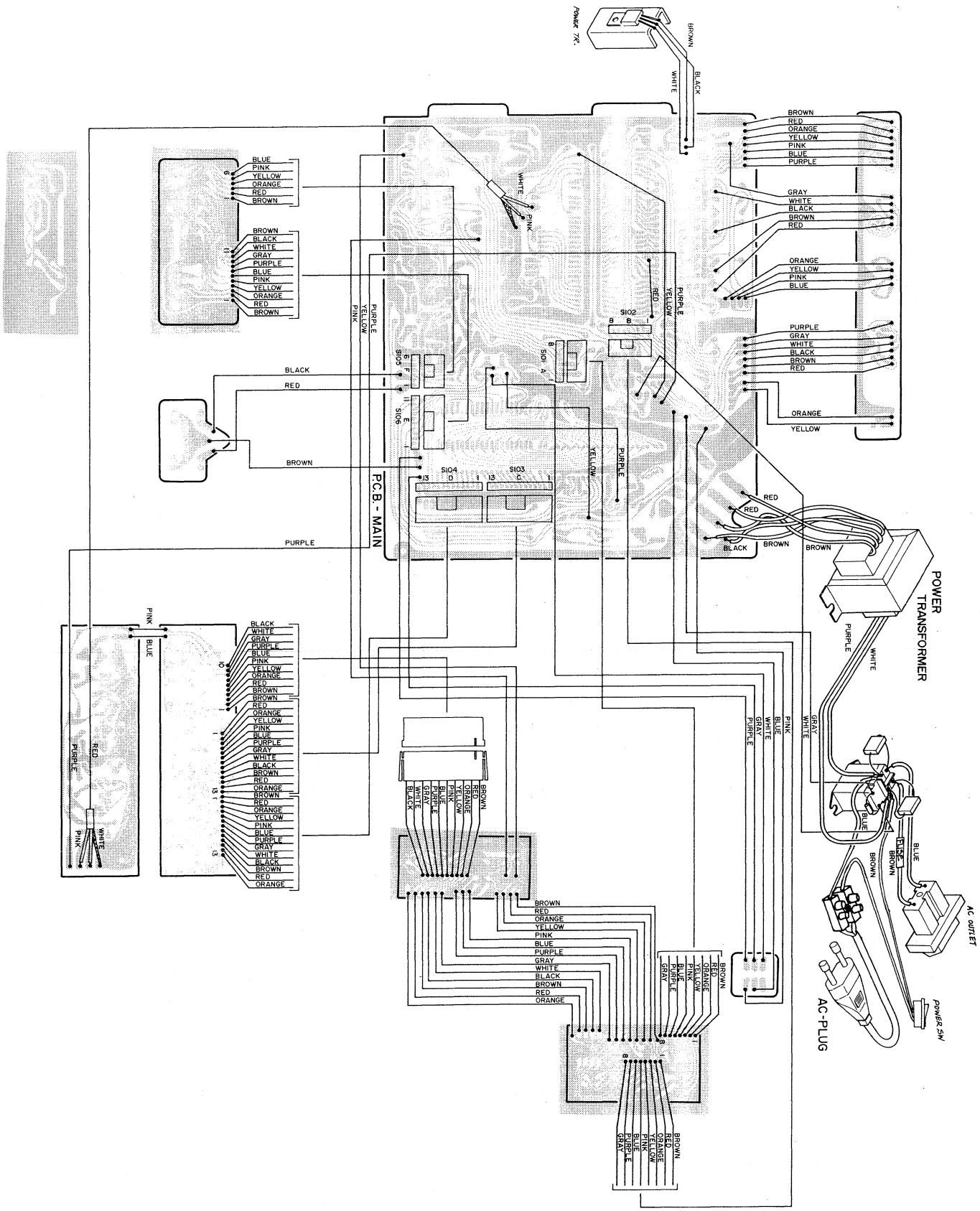
TI-2600 REMOTE CONTROL RECEIVER/AUDIO TIMER ALIGNMENT PROCEDURES

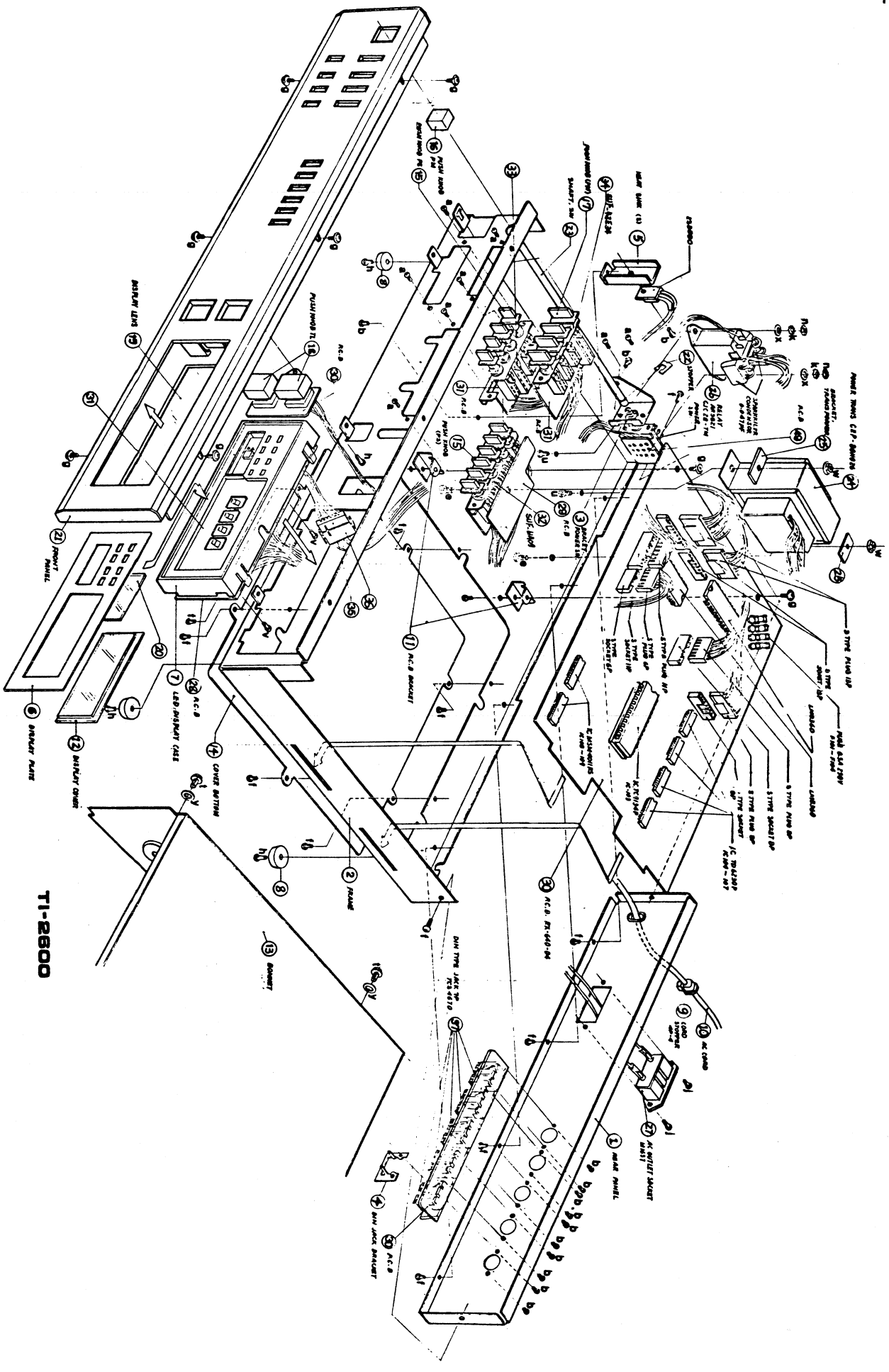
1) **Adjustment of oscillation frequency**
Depress the standby switch and connect the frequency counter to the test point of 455 KHZ. Set the frequency by VC101 to be within 455 KHZ plus/minus 2 KHZ.

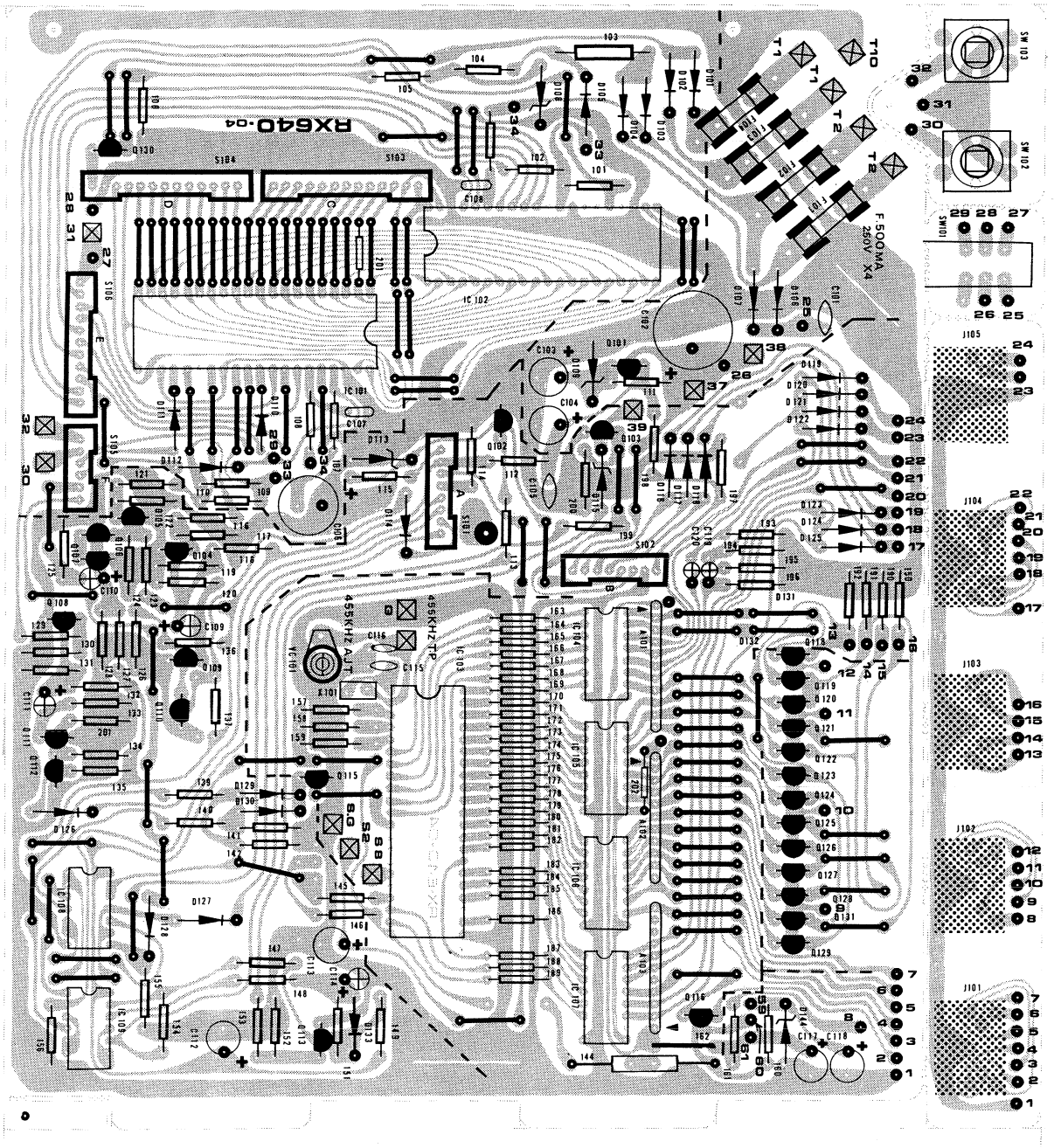
2) **Adjustment of 38 KHZ tuning coil**
Depress the standby switch and apply approximately 10 mV to the gate of EFT Q301 on the 38 KHZ frequency. Connect the milivolt meter to the cathod D303 and adjust L301 so that the output may become at its maximum.

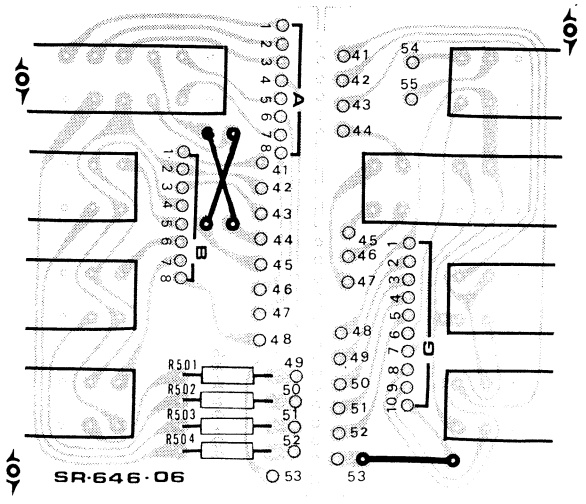

POWER TRANS.
FUSE 500mA 250V x4
AC 220V
S5277 x 6
D412-415 GL-8N030 x 4
IC301 TA7120P
IC101 LM8360
IC102 LM8360
IC103 TC9134P
IC109 4011 1/2
IC108 4011
S101 STAN BY
S103 FAST
S104 SLOW
S501 REMOCON TIMER
S502 PHONO
S503 TUNER
S504 TAPE
S505 EVER ON
S506 EVER OFF
S507 AUTO
S508 SLEEP TIMER
S601 SECOND
S602 CLOCK
S603 TIME
S604 TIMER ON
S605 TIMER OFF
S606 SLEEP
J701 PHONO
J702 AMPLIFIER
J703 TUNER (K)
J704 TUNER (T)
J705 TAPE
REMOTE CONTROL RECEIVER
AUDIO TIMER TI 2600

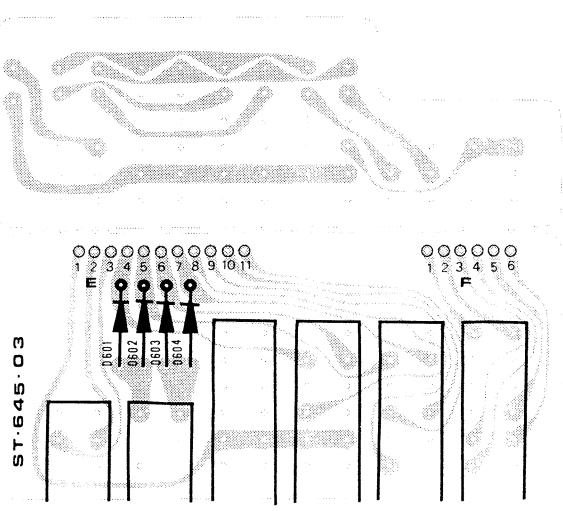
2—4 WIRING VIEW

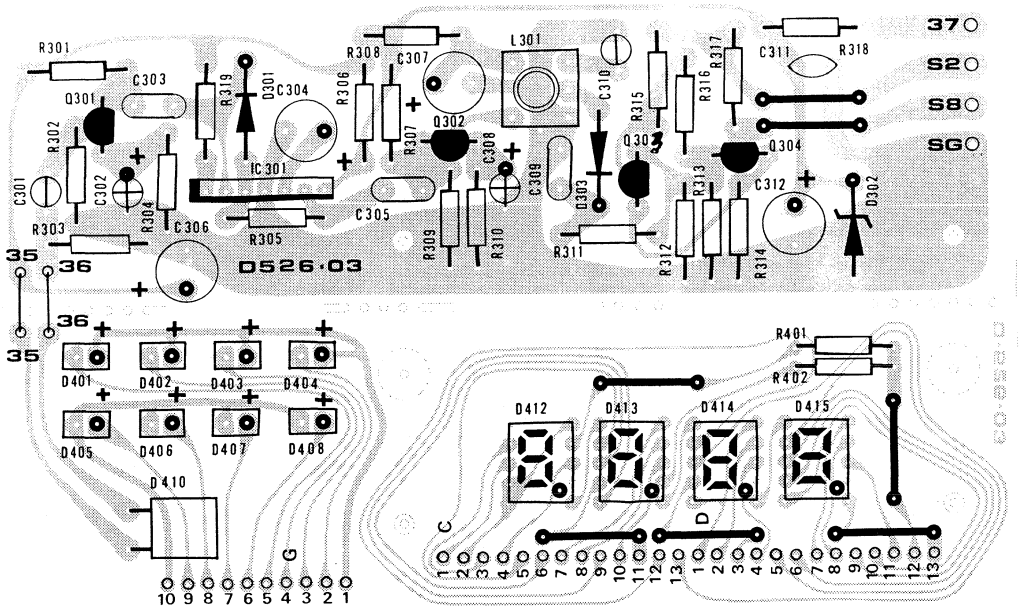



TI-2600


RX640-04
F 500MA
250V X4
455KHZ ALT
455KHZ TPO


SR-646-06


ST-645-03



2—7 PARTS LIST

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
LED DISPLAY SECTION			
260034		PCB D-526-03	1
260066	D412, 413, 414, 415	LED GL-8N03D	4
265181	D401, 402, 403, 404, 405, 406, 407, 408	LED GL-9PR2	8
260071	IC301	IC TA7120P	1
260061	Q304, 303, 302	TR. 2SC 1815 (Y)	3
265014	Q301	FET 2SK 30A	1
812068	D303	DIODE 1N-60	1
265024	D301	DIODE 1S-1555	1
265023	D302	ZENOR DIODE 05Z-13	1
260073	D410	INFRA-RED HOT DIODE TPS-703	1
260074	L301	COIL S103175	1
		CAPACITORS	
260045	C304	ELECT. CAP. 330μF 10V	1
260046	C306, C312	ELECT. CAP. 220μF 16V	2
260047	C307	ELECT. CAP. 22μF 25V	1
260075	C301	STYROL CAP. 560PF	1
260076	C310	STYROL CAP. 820PF	1
265056	C309	MYLAR CAP. 0.047μF	1
260052	C303, C305	MYLAR CAP. 0.001μF	2
260060	C311	CERAMIC CAP. 0.01μF	1
812221	C302	TANTAL CAP. 0.22μH 16V	1
260078	C308	TANTAL CAP. 0.1μF 16V	1
		RESISTORS	
260001	R310	RESISTOR 100Ω 2/8W	1
812085	R401, 402	RESISTOR 220Ω 2/8W	2
260003	R304	RESISTOR 270Ω 2/8W	1
812083	R318, 308	RESISTOR 560Ω 2/8W	2
812081	R314	RESISTOR 1KΩ 2/8W	1
260006	R301	RESISTOR 3.9KΩ 2/8W	1
260007	R311, R306, R316	RESISTOR 4.7KΩ 2/8W	3
812078	R309	RESISTOR 10KΩ 2/8W	1
812076	R317	RESISTOR 22KΩ 2/8W	1
260010	R313, 316, 315	RESISTOR 27KΩ 2/8W	3
812075	R307	RESISTOR 47KΩ 2/8W	1
260012	R319	RESISTOR 56KΩ 2/8W	1
812072	R303, 302	RESISTOR 100KΩ 2/8W	2
260014	R305	RESISTOR 1MΩ 2/8W	1
265156		JUMPER LEAD 12.5 mm	7
260081		SOCKET 13P T1-2600-13P-04	2
260082		PLUG 10P T1-2600-10P-05	1

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
260035		PCB SR-646-06	1
260083		PUSH SWITCH SUF 42E 34	1
260084		PUSH SWITCH SUF 42E 33	1
260015	R504, 503, 502, 501	RESISTOR 5.6KΩ 2/8W	4
265156		JUMPER LEAD 12.5 mm	2
260086		SOCKET T1-2600-8P-03	2
260141		SOCKET T1-2600-10P-06	1
260036		PCB ST-645-03	1
265024	D601, 602, 603, 604	DIODE 1S-1555	4
260087		SOCKET T1-2600-11P-02	1
260088		SOCKET T1-2600-6P-01	1
260089		PUSH SWITCH SUF-61A09	1
260090		POWER XFORMER CEP-80H026	1
260091		RELAY AR3821	1
260092		AC SOCKET M1657 2.5A-250V	1
265188		POWER CORD	1
265189		CORD STOPPER 4K-4	1
265186		SPARKKILLER 0.047μF	2
260096		FUSE 500 mA 250V 5φ	4
260042		DIODE 1S 1885	1
260037		PCB RX-640-04	1
260098	IC103	IC TC9134P	1
260099	IC101, 102	IC LM8360	2
260100	IC109, 108	IC MSM-4011RS	2
260101	IC104, 105, 106, 107	IC TD 6230 P	4
260097		Fuse 2.5A 250V	1
		TRANSISTORS	
265011	Q117	TR 2SD880 (Y)	1
265010	Q103	TR 2SC1627A (Y)	1
265004	Q130	TR 2SA 965 (Y)	1
265007	Q101, 102, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 115, 116, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 131	TR 2SC 1815 (Y)	27
		DIODES	
265023	D101, 102, 103, 104, 105, 106, 107	DIODE S5277	7
265024	D110, 111, 112, 114, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 133	DIODE 1S1555	20
265033	D109	ZENOR DIODE 05Z7.5	1
260103	D144	ZENOR DIODE 05Z5.6	1
260104	D115, 113, 108	ZENOR DIODE 05Z5.1	3
260105	A1, 2, 3	RESISTOR 10KΩ 10R TYPE	3
260054	X1	CERAMIC OSCILLATOR KBR-455(B)	1

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
		CAPACITORS	
260055	VC101	CERAMIC TRIMMER 50P	1
260056	C101, 105	CERAMIC CAP. SL 0.01μF	2
260057	C115	CERAMIC CAP. NPO 100PF	1
260058	C116	CERAMIC CAP. NPO 30PF	1
260059		CERAMIC CAP. 0.001μF	3
812156	C108, 107	MYLAR CAP. 0.01μF	2
260106	C110, 109, 111, 119, 120	TANTAL CAP. 3.3μF 16V	5
260107	C114	TANTAL CAP. 0.47μF 16V	1
812028	C102	ELECT. CAP. 1000μF 25V	1
812029	C106	ELECT. CAP. 470μF 25V	1
265038	C103, 104, 112, 113, 117, 118	ELECT. CAP. 100μF 10V	6
		RESISTORS	
260016	R103	RESISTOR 22Ω 2W	1
260017	R144	RESISTOR 10Ω 2W	1
260018	R202	RESISTOR 10Ω 1/2W	1
260019	R201	RESISTOR 68Ω 1/8W	1
260020	R112, 161	RESISTOR 10Ω 1/8W	2
260021	R105	RESISTOR 470Ω 1/8W	1
260022	R160	RESISTOR 820Ω 1/8W	1
260023	R104	RESISTOR 1.2KΩ 1/8W	1
260024	R111	RESISTOR 2.2KΩ 1/8W	1
260025	R106, 150, 190, 191, 192	RESISTOR 4.7KΩ 1/8W	5
260026	R114	RESISTOR 5.6KΩ 1/8W	1

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
260027	R101, 109, 110, 113, 115, 116, 118, 121, 123, 126, 127, 129, 132, 134, 135, 136, 137, 139, 140, 141, 142, 145, 146, 149, 152, 153, 157, 158, 159, 197, 198, 199, 200, 201	RESISTOR 10KΩ 1/8W	35
260028	R148, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189	RESISTOR 22KΩ 1/8W	28
260029	R117, 122, 130	RESISTOR 47KΩ 1/8W	3
260030	R102, 107, 108, 119, 120, 124, 125, 128, 131, 133, 138, 155, 156, 193, 194, 195, 196	RESISTOR 100KΩ 1/8W	17
260031	R138, 147	RESISTOR 680KΩ 1/8W	2
260032	R154	RESISTOR 1MΩ 1/8W	1
260033	R151	RESISTOR 10MΩ 1/8W	1
265156		JUMPER LEAD 12.5 m/m	92
265150		FUSE HOLDER 5φ	8
265153		LAPPING PIN	16
260111		FUSE 0.5A 250V 5φ	4
265164		TACT SW KHC-10901	2
260114		SINGLE SW SUE 12KG5	1
260115		SOCKET S TYPE 13P	2
260116		SOCKET S TYPE 11P	1
260117		SOCKET S TYPE 8P	2
260118		SOCKET S TYPE 6P	1
265173		DIN JACK 7P TCS4670	5

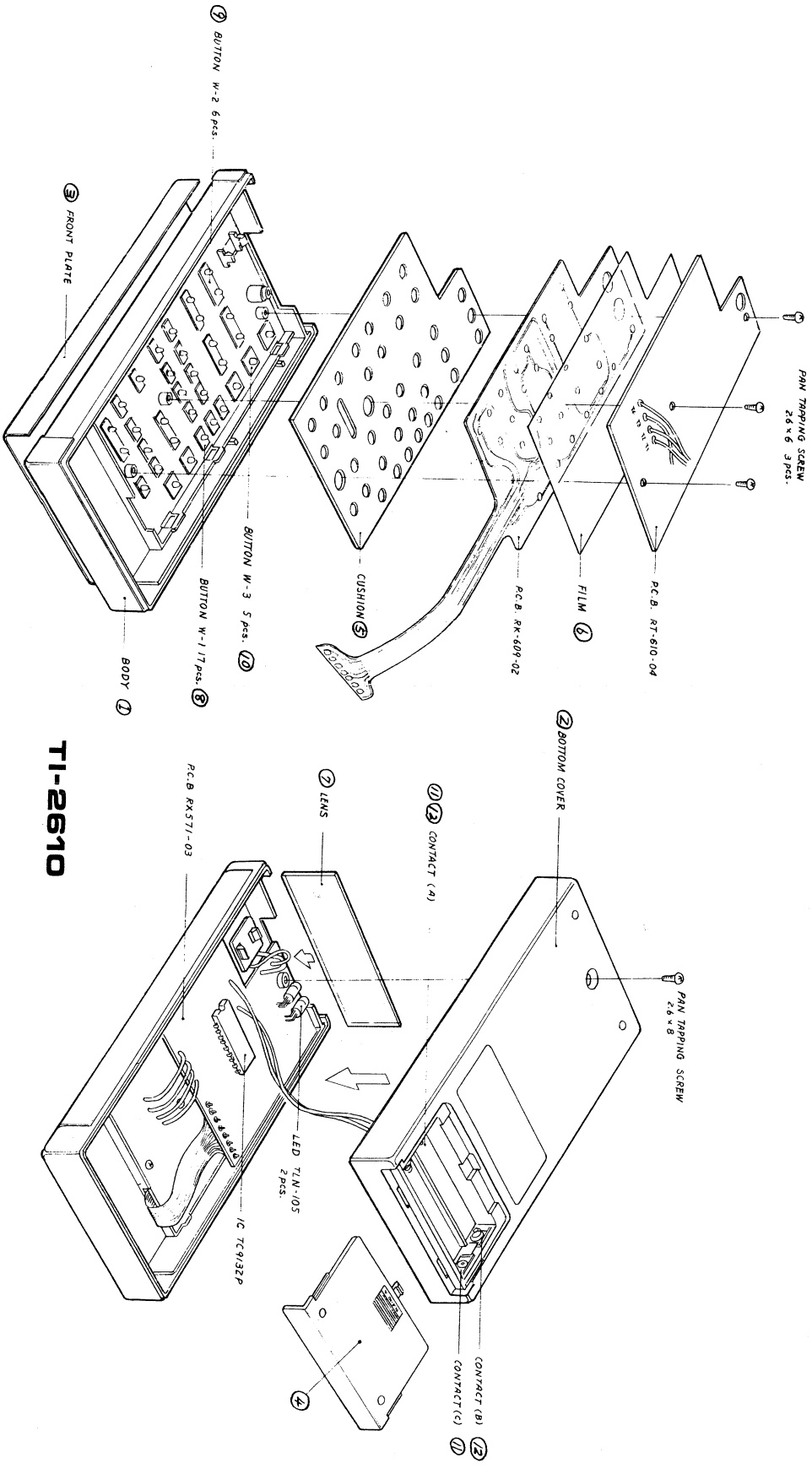
EXPLODED VIEW PARTS

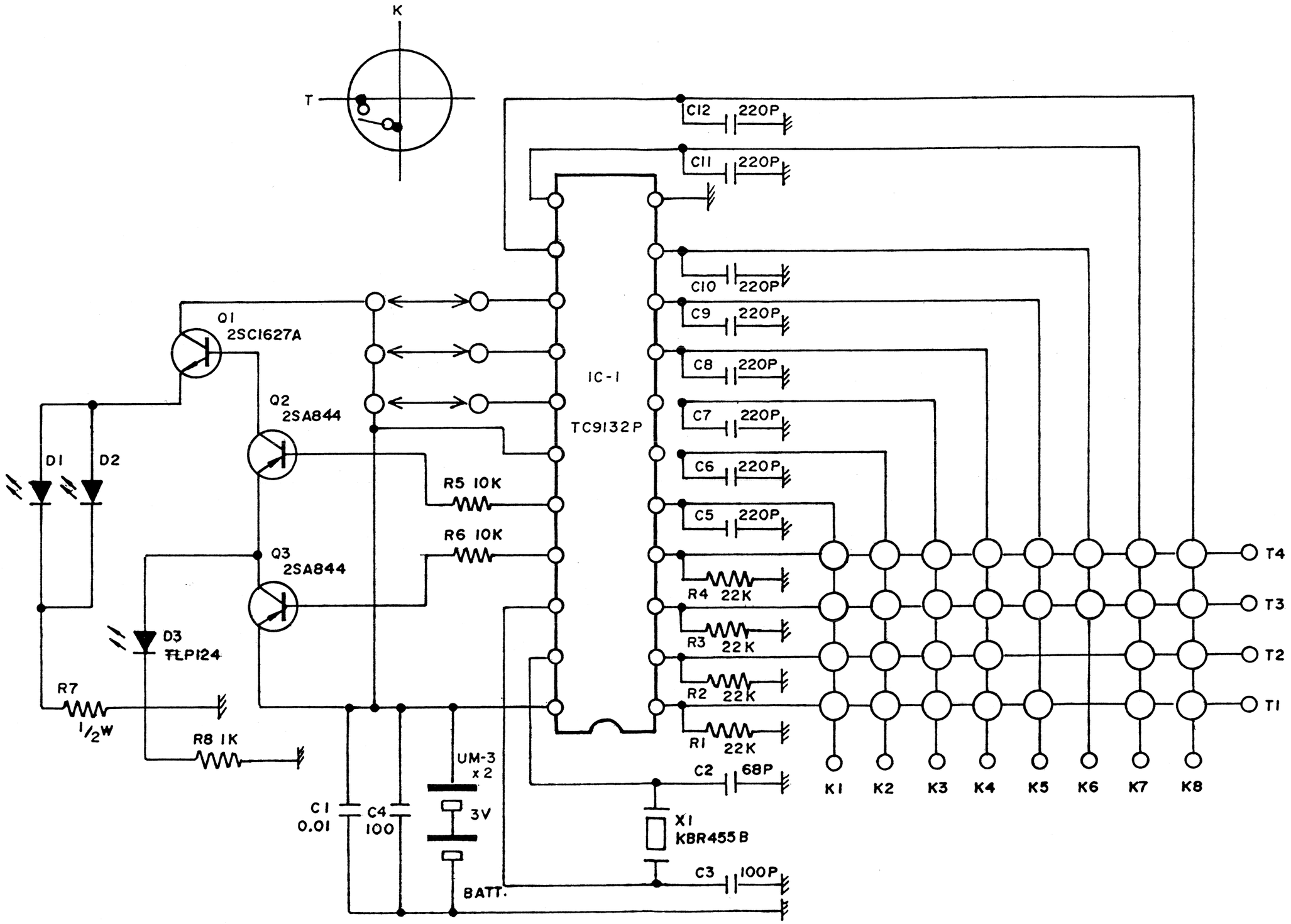
PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
260121	1	REAR PANEL	1
260122	2	CHASSIS FLAME	1
265206	3	POWER SW MOUNTING BRACKET	1
265207	4	SOCKET MOUNTING BRACKET	5
265209	5	HEAT SINK	1
265215	6	LED PLATE	1
265210	7	LED CASE	1
265211	8	FOOT No. 7102	4
265189	9	CORD STOPPER 4K-4	1
265188	10	AC CORD	1
260138	11	PCB MOUNTING BRACKET	2
265216	12	LED ACRYL	1
265217	13	BONNET	1
260130	14	BOTTOM PLATE (A)	1
265220	15	PUSH KNOB (A)	10
265221	16	PUSH KNOB (B)	1
260133	17	PUSH KNOB (D)	4
265224	18	PUSH KNOB (G)	2
265226	19	PANEL ACRYL	1
260136	20	PHOTO DIODE ACRYL	1
260137	21	FRONT PANEL	1
265237	22	STOPPER, SHAFT	1
265230	23	SHAFT, POWER SW	1
260090	24	POWER XFORMER	1
260140	25	BRACKET, POWER XFORMER	2
260091	26	RELAY	1
260092	27	AC OUTLET	1
260034	28	PCB, D-526-03	1
260036	29	PCB, ST-645-03	1
260037	30	PCB, RX-640-04	1
260035	31	PCB, SR-646-05	1
260089	32	PUSH SW, SUF-61A09	1
260084	33	PUSH SW, SUF 42E33	1
260083	34	PUSH SW, SUF 42E34	1
260082	35	PLUG, 10P-5	1
260141	36	SOCKET, 10P-6	1
265173	37	DIN JACK 7P	5

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
		MISCELLANEOUS	
260139		INSULATION COVER	2
260097		7P DIN CORD	4
260125		INSTRUCTION MANUAL	1
265199		TENSAI CERTIFICATE	1
265200		SNOW BOX	1 PAIR
260126		SCREW	1 SET
265197		POLY BAG	1
260127		INDIVIDUAL CARTON	1
260128		LEAD WIRE	1 SET
265193		BINDER, LEAD	15
364768		BATTERY UM-3X3	3
260120		SCREW	1 SET

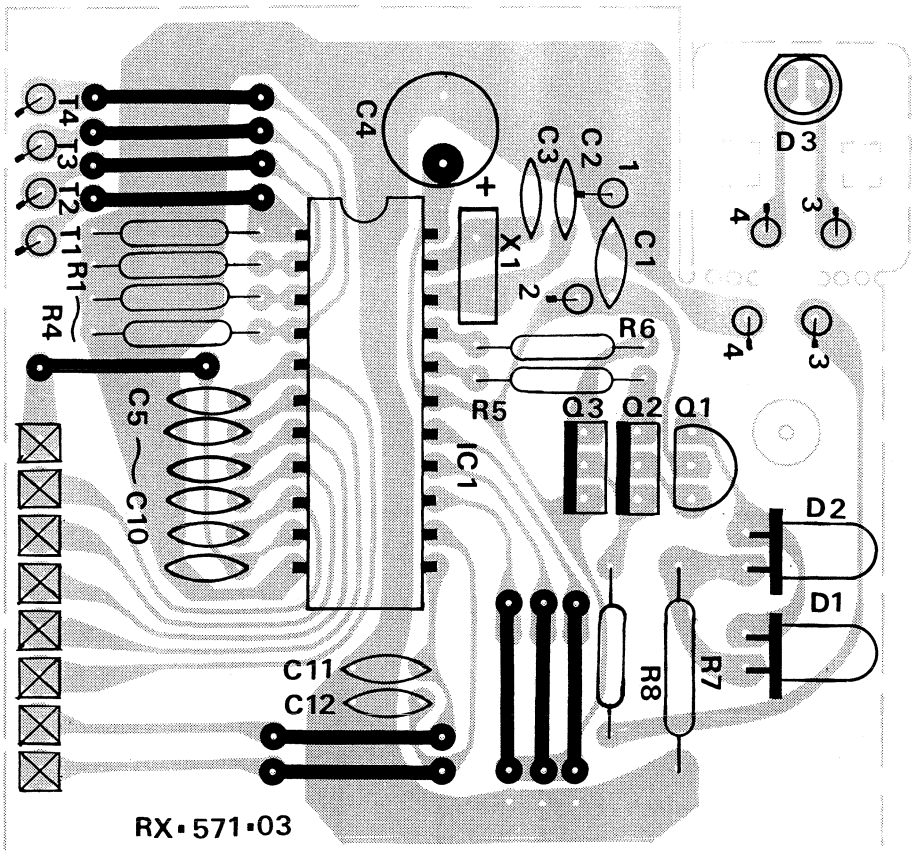
3. TI2610 [Remote Control Transmitter]

3−1 EXPLODED VIEW




K
T
C12 220P
C11 220P
C10 220P
C9 220P
C8 220P
C7 220P
C6 220P
C5 220P
R4 22K
R3 22K
R2 22K
R1 22K
IC-1
TC9132P
Q1
2SC1627A
Q2
2SA844
Q3
2SA844
D1
D2
D3
TLP124
R5 10K
R6 10K
R7
1/2W
R8 1K
C1
0.01
C4
100
UM-3
x2
3V
BATT.
C2 68P
X1
KBR455B
C3 100P
K1
K2
K3
K4
K5
K6
K7
K8
T4
T3
T2
T1

3—3 PRINTED CIRCUIT BOARDS



3—4 PARTS LIST

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
261001		PCB RX-571-03	1
261018	IC1	IC TC-9132P	1
265163	D3	LED TLR124	1
261020	D1, D2	LED TLN-105	2
261004	Q2, Q3	TRANSISTOR 2SA844(E)	2
265010	Q1	TRANSISTOR 2SC1627(A)	1
261039	X1	CERAMIC OSCILLATOR KBR-455B	1
		CAPACITORS	
265076	C5 ~ C12	CERAMIC 220PF-SL	8
265074	C1	" 0.01μF-SL	1
261008	C3	" 100PF NPO	1
261009	C2	" 68PF NPO	1
261014	C4	ELECT. 100μF 6.3V	1
		RESISTORS	
261010	R1 – R4	2/8W 22KΩ	4
261011	R6, R5	" 10KΩ	2
261012	R8	" 1KΩ	1
261013	R7	1W 1Ω	1
261015		JUMPER LEAD 12.5 m/m	10
261016		LAPPING PIN	8
261002		PCB RK-609-02	1
261003		PCB RT-610-04	1

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
		EXPLODED VIEW PARTS	
261021	F-90400 1	UPPER CASE	1
261022	F-90388 2	BOTTOM CASE	1
261023	D-90385 3	PLATE	1
261024	C-10988 4	BATTERY COVER	1
261025	C-10984 5	CUSHION FOR KNOBS	1
261026	C-10983 6	INSULATION PLATE	1
261027	C-10982 7	LENS FOR TRANSMITTING WINDOW	1
261028	C-10985 8	KNOB (W-1)	17
261029	C-10986 9	KNOB (W-2)	6
261030	C-10987 10	KNOB (W-3)	5
261031	C-21002 11	ELECTRODE PLATE (A, C)	2
261032	C-21003 12	ELECTRODE SPRING (A, B)	2
		MISCELLANEOUS	
261034	D-90389	SNOW CASE	1
261035	C-21019	COVER, SNOW CASE	1
261036		INSTRUCTION MANUAL	1
265199		TENSAI CERTIFICATE	1
261038		SNOW BOX	
265193		LEAD WIRE	1 SET
261037		POLY BAG	1
261033		SCREW	1 SET
364768		BATTERY UM-3	2

4. TT3645 (Stereo Tuner)

4—1 SPECIFICATIONS

FM SECTION	
Tuning Range	87.5 — 108 MHz
Antenna Impedance	300 ohm balanced/ 75 ohm unbalanced
Usable Sensitivity	1.2 μV
Selectivity	70 dB
Image Response Ratio	70 dB
IF Response Ratio	70 dB
AM Suppression Ratio	55 dB
Capture Ratio	2 dB
Harmonic Distortion (STEREO 1,000 Hz)	0.12%
Signal-to-Noise Ratio (MONO 400 Hz, 100% MOD)	60 dB
Stereo Separation	35 dB (1,000 Hz)
Frequency Response	18 — 17000 Hz
Output Level	315 mV/4.7 kohms

MW SECTION	
Tuning Range	522 — 1,611 kHz
Usable Sensitivity	400 μV/m
Selectivity	30 dB
Image Response Ratio	35 dB (1,000 kHz)
IF Response Ratio	30 dB (1,000 kHz)
Output Level	315 mV/4.7 kohms
LW/SECTION	
Tuning Range	137 — 372 kHz
Usable Sensitivity	1 mV/m
Selectivity	30 dB
Image Response Ratio	40 dB (200 kHz)
IF Response Ratio	25 dB (200 kHz)
Output Level	315 mV/4.7 kohms
Power Consumption	17W
Dimensions (WHD)	430 × 80 × 250 m/m
Weight	5.0 kg

Our policy is one of continuous development of our products and we may change specifications without notice.

4—2 ALIGNMENT

TT-3645 FM/MW/LW DIGITAL SYNTHESIZER TUNER ALIGNMENT PROCEDURES

A) DIGITAL SECTION ALIGNMENT

1. **Basic frequency**
   Connect the frequency counter to TEST (A) terminal and adjust it to 9.000 MHZ by TC401 trimmer.
2. **CPU clock oscillation**
   (This is just for CLOCK inside of CPU, not related to the system)
   Connect the frequency counter to TEST (B) terminal and adjust it to 200 KHZ by T401 coil.

B) ALIGNMENT FOR CONTROLING THE LINEAR SECTION THROUGH DIGITAL SECTION

Connect + of tester to the lapping terminal 43 on the digital PCB (CPT-80H061B) and — of tester to the ground like chassis flame or something.
Turn each trimmer and semi-fixed resister to the centre condition, meanwhile, tuner up VR6 and VR7 semi-fixed resisters to the left direction.

1. **FM BAND**

a) Adjust the frequency display to 87.50 MHZ and set the tester at 1.5V by T6 coil.
b) Adjust the frequency display to 108.00 MHZ and set the tester at 12V by TC4 trimmer.
c) Repeat the above adjustments a and b.

Connect some unit like amplifier or oscilloscope to the output terminals to check the output. Set the bar antenna coil (LW=left MW=right) to the place of 15 mm from the core.

2. **MW (LW) BAND**

a) Adjust the frequency display to 522 (137) KHZ and turn the T9 (T10) coil just until the output from the output terminal goes out. In this case, voltage is about 1V or a little over.
b) Adjust the frequency display to 1611 (372) KHZ and set the tester at 9V by TC6 (TC5) trimmer.
c) Repeat the above adjustments a and b.

C) TRACKING ALIGNMENT

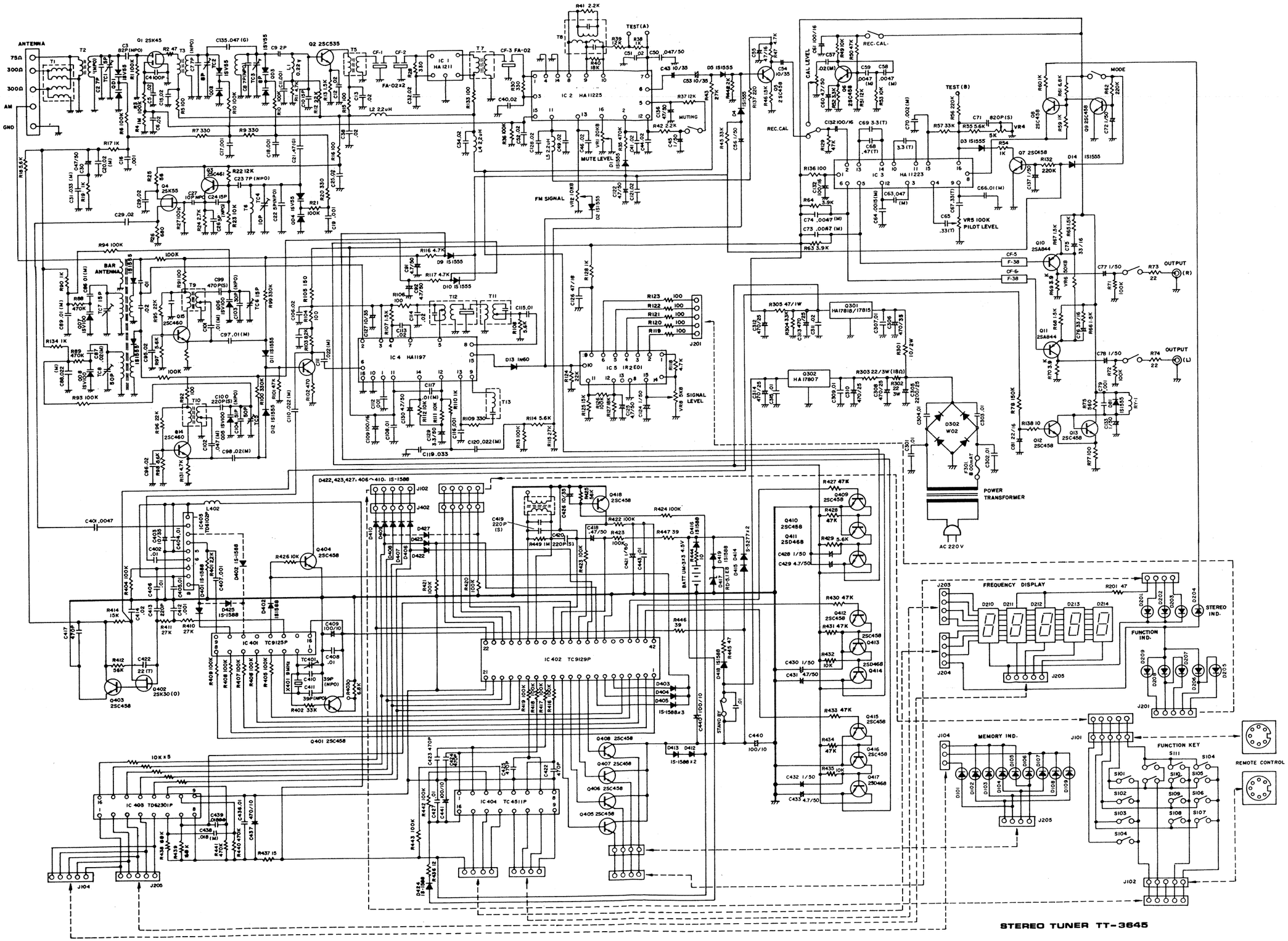
1. **FM BAND**

a) Adjust the frequency display to 88.00 MHZ and also set the SSG at 88.00 MHZ. Then, turn T2, T3, T4 to get the maximum sensitivity by reducing the ATT.
b) Adjust the frequency display to 107.00 MHZ and also set the SSG at 107.00 MHZ. Then, turn TC1, TC2, TC3 to get the maximum sensitivity by reducing the ATT.
c) Repeat the above methods a and b to get the maximum sensitivity (about under 1 UV).

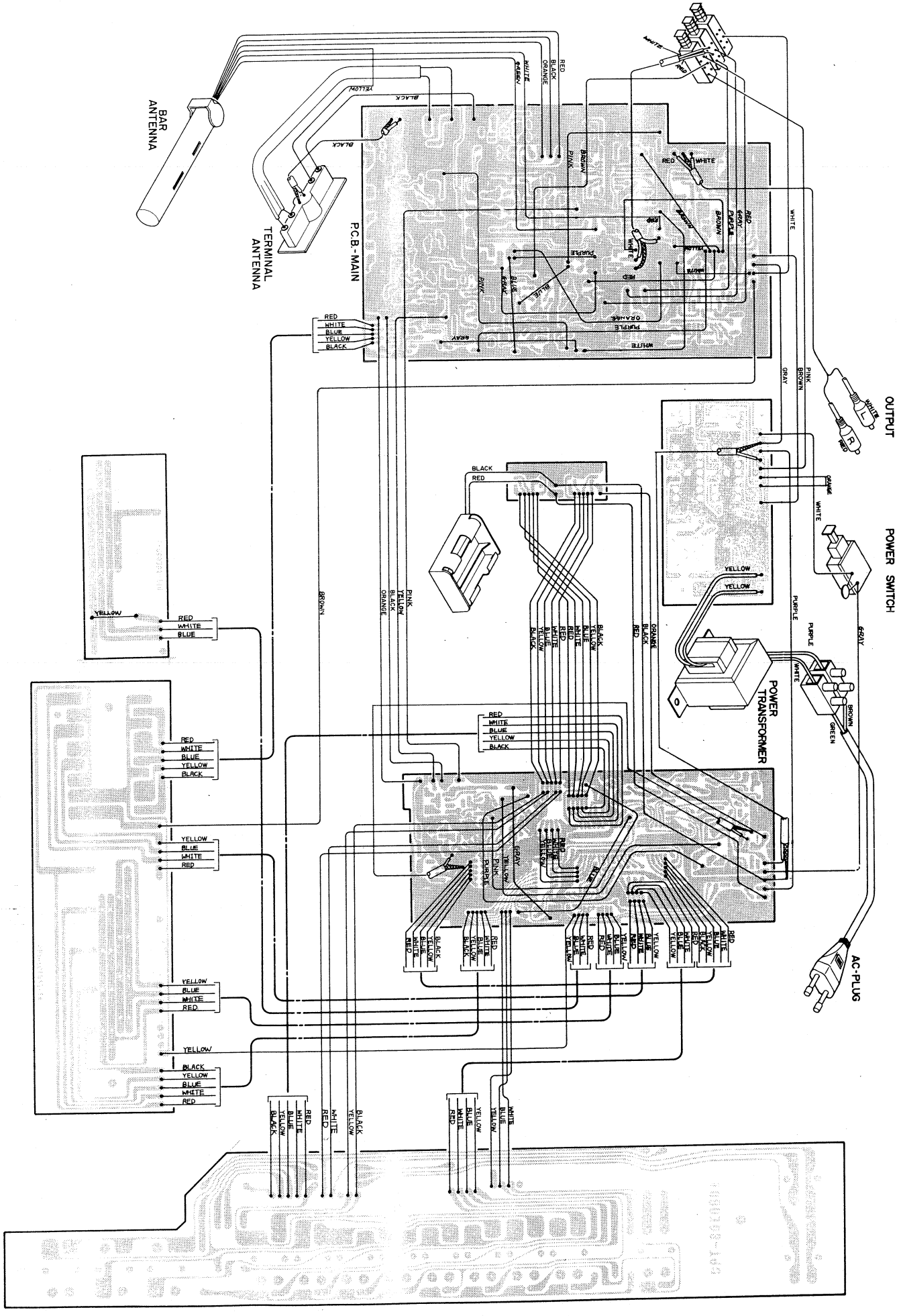
2. **MW (LW) BAND**

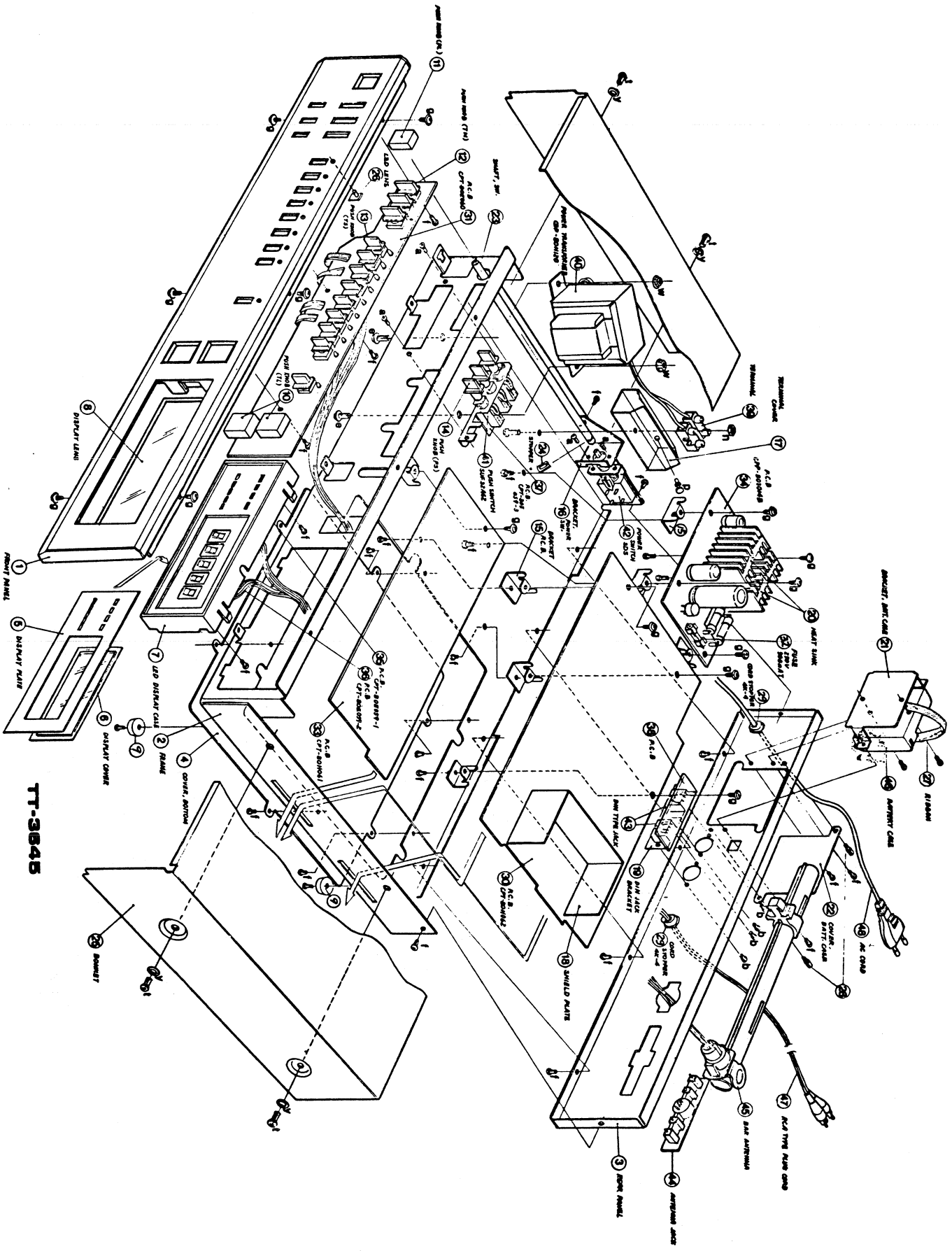
a) Adjust the frequency display to 600 (160) KHZ and also set the SSG at 600 (160) KHZ. Then, move or slide the bar antenna coil (LW=left, MW=right) to get the maximum sensitivity by reducing the ATT. But when bar antenna coil is far from the core, set it at the palce apart from 15 mm and get the maximum sensitivity by T9 (T10).
b) Adjust the frequency display to 1450 (350) KHZ and also set the SSG at 1450 (350) KHZ. Then, turn TC6 (TC5) to get the maximum sensitivity by reducing the ATT.
c) Repeat the above methods a and b to get the maximum sensitivity.

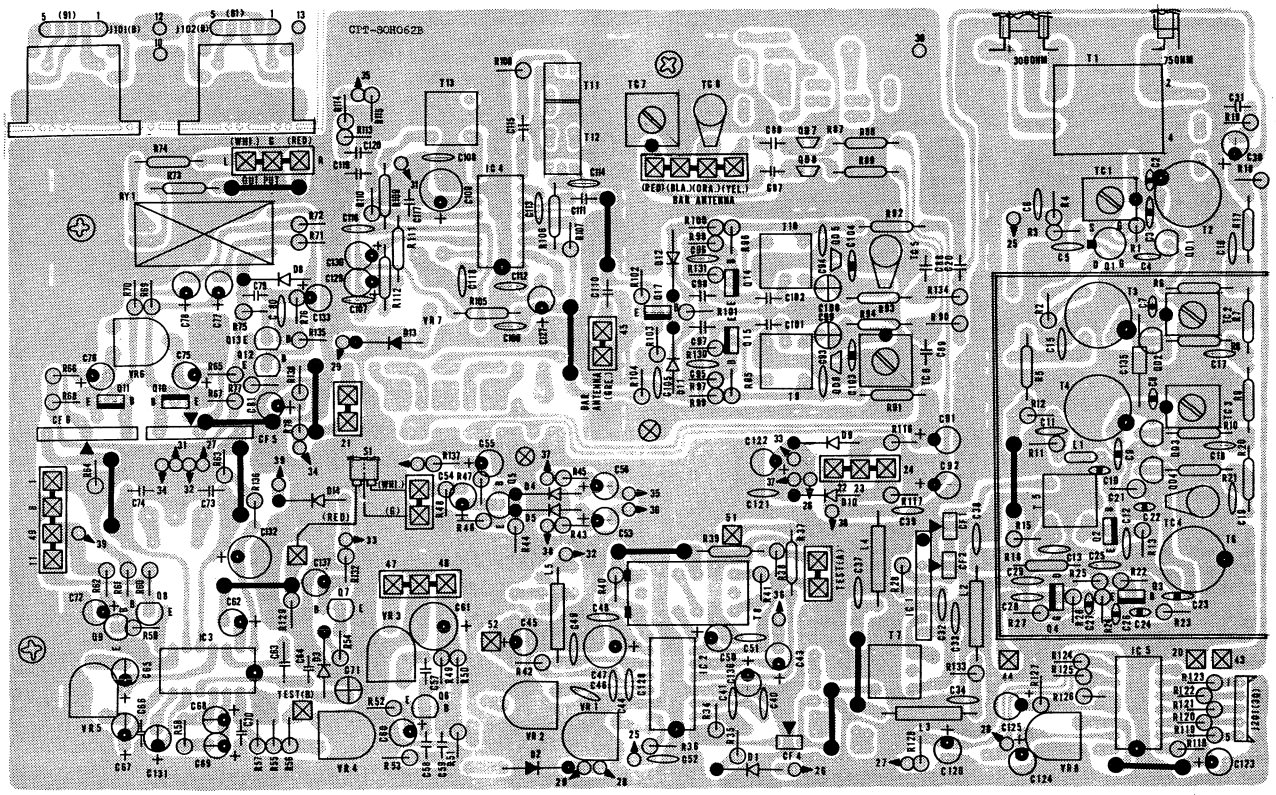
4–3 SCHEMATIC DIAGRAM

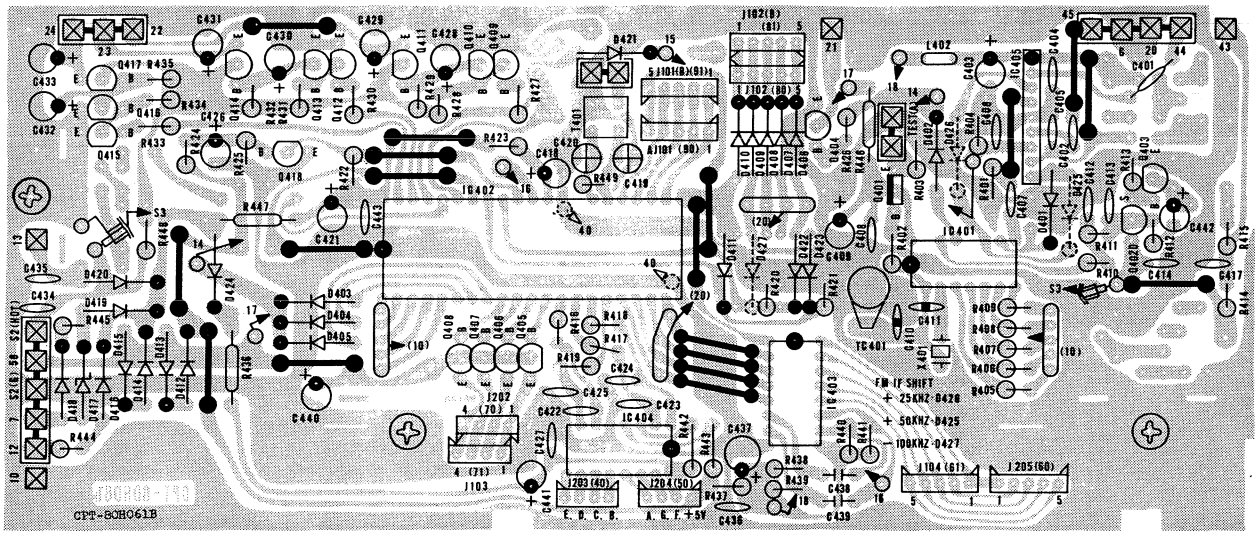


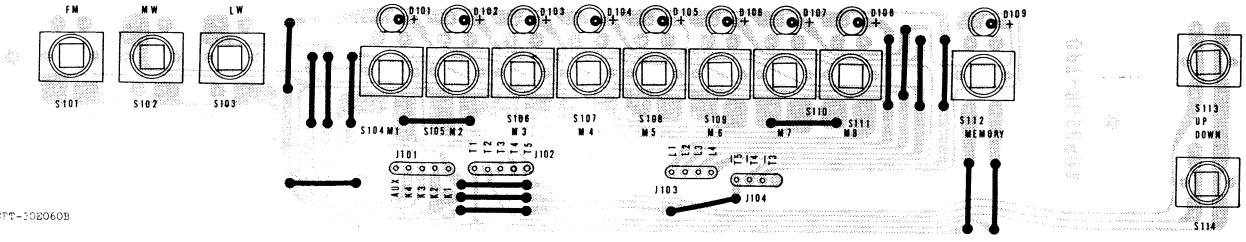
STEREO TUNER TT-3645

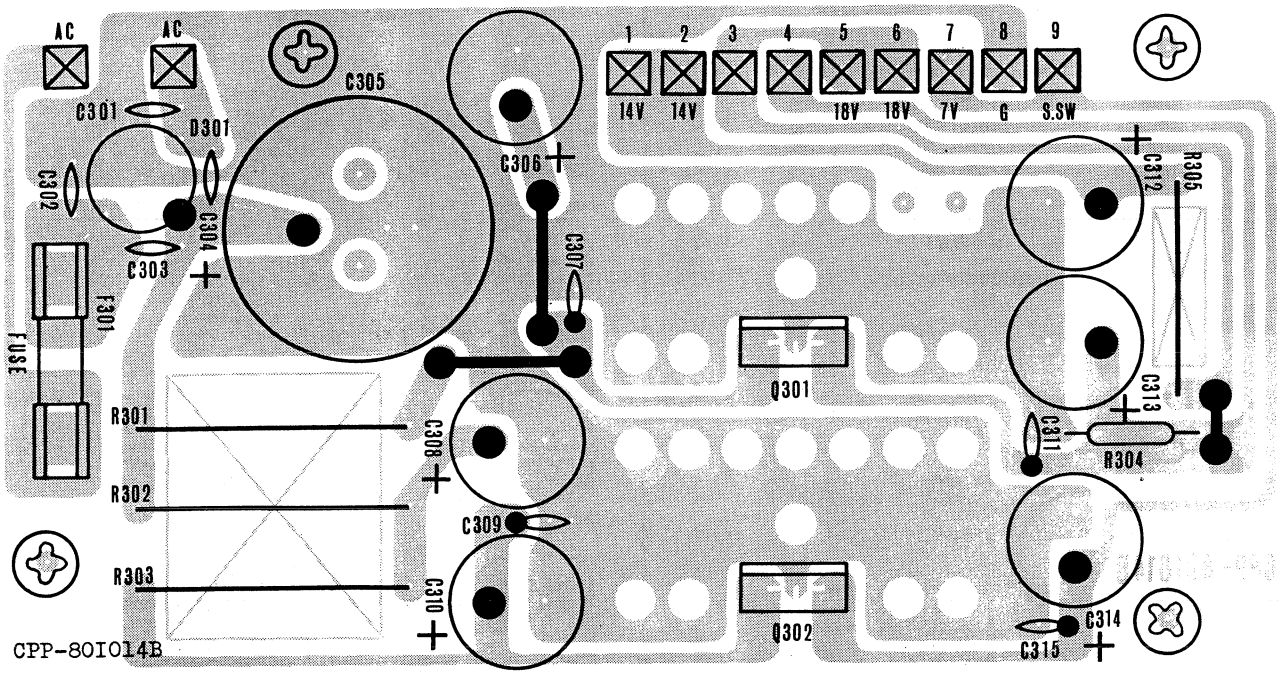

BAR ANTENNA
TERMINAL ANTENNA
P.C.B.-MAIN
OUTPUT
POWER SWITCH
POWER TRANSFORMER
AC-PLUG

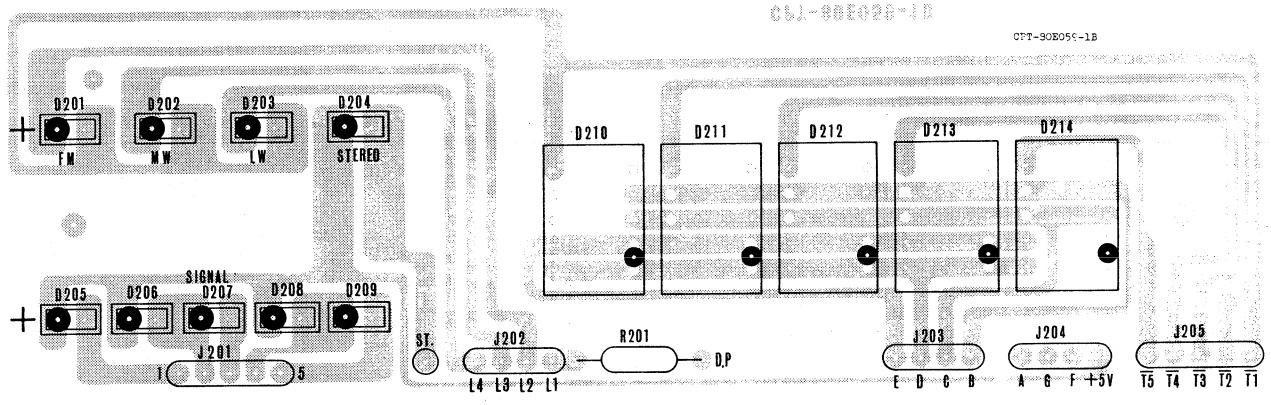

TT-3645


CPT-80H062B


CPT-80H061B


CPT-80E060B


AC
AC
C305
C301
D301
C302
C304
C303
C306
C307
F301
FUSE
R301
R302
R303
C308
C309
C310
1
2
3
4
5
6
7
8
9
14V
14V
18V
18V
7V
G
S.SW
C312
R305
Q301
C313
C311
R304
Q302
C314
C315
CPP-80I014B


D201
FM
D202
MW
D203
LW
D204
STEREO
D205
D206
SIGNAL
D207
D208
D209
J201
1
5
ST.
J202
L4 L3 L2 L1
R201
D.P
D210
D211
D212
D213
D214
J203
E D C B
J204
A G F +5V
J205
T5 T4 T3 T2 T1

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
364503		PCB MOUNTING BRAKET (B) PCB MOUNTING SCREWS 3×6	
364501		PCB CPT-80H062	1
		ICs	
364511	IC4	IC HA-1197	1
364512	IC3	IC HA-11223W	1
364513	IC2	IC HA-11225	1
364514	IC1	IC HA-1211	1
364515	IC5	IC IR-2E01	1
		TRANSISTORS	
364523	Q1	Tr. 3SK-45(B)	1
364524	Q4	Tr. 2SK-55(D)	1
364525	Q10, 11	Tr. 2SA-844(D)	2
364526	Q5, 6, 7, 8, 9, 12, 13	Tr. 2SC-458(B)	7
364527	Q14, 15, 50, 17	Tr. 2SC-460(B)	4
364528	Q3	Tr. 2SC-461(B)	1
364529	Q2	Tr. 2SC-535(B)	1
		DIODES	
364534	QD1, 2, 3, 4	1SV-55	4
364535	QD5, 6, 7, 8	1SV-100	4
265024	D1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 14	1S-1555	13
812068	D13	1N-60	1
364691	L2, 3, 4, 5	PEAKING COIL 2.2μH	4
364692	L1	MICRO INDUCTOR 0.22μH	1
364693	L6	MICRO INDUCTOR 0.47μH	1
364694	L7, 8	MICRO INDUCTOR 10μH	2
364695	F5, 6	38 KHZ FILTER F-38	2
364696	F1, 2, 4	10.7 KHZ FILTER FA-02	3
364697	RY-1	RELAY URT-103	1
265173		7P DIN SOCKET	2
364686	C4	TRIMMER CERAMIC 10PF	1
364687	C5, 8	TRIMMER CERAMIC 50PF	2
364688	C1	TRIMMER FILM 5PF	1
364689	C2, 3	TRIMMER FILM 8PF	2
364690	C6, 7	TRIMMER FILM 15PF	2
		COILS	
364545	TI	COIL CRF-9F021	1
364546	T6	COIL 3A6	1
364547	T8	COIL 225H01	1
364548	T13	COIL S-103-185	1
364549	T2	COIL S-103-186	1
364550	T3	COIL S-103-187	1
364551	T4	COIL S-103-188	1
364552	T10	COIL S-103-189	1
364553	T9	COIL S-103-191	1
364554	T5, 7	COIL 55T-314	2
364555	T12	COIL S-103-193	1
364556	T11	COIL S-103-194	1
265182	VR4, 8	SEMI-FIXED RESISTOR 5KΩ(B)	2
812240	VR2, 7	SEMI-FIXED RESISTOR 10KΩ(B)	2
364609	VR1	SEMI-FIXED RESISTOR 20KΩ(B)	1
812214	VR6	SEMI-FIXED RESISTOR 50KΩ(B)	1
812213	VR5	SEMI-FIXED RESISTOR 100KΩ(B)	1
364612	VR3	SEMI-FIXED RESISTOR 500KΩ(B)	1
		CAPACITORS	
364558	C21, 135	CAPACITOR (GLASS) 0.47PF	2
364559	C100	STYROL 220PF(J)	1
364560	C99	STYROL 470PF(J)	1
260076	C71	STYROL 820PF(J)	1
364562	C65, 67	TANTAL 0.33μF	2
260107	C68	TANTAL 0.47μF	1
260106	C69, 131	TANTAL 3.3μF	2
364565	C9	NPO 2PF	1
364566	C1, 22, 26	NPO 5PF	3
364567	C2, 7, 8, 23	NPO 1PF	4
364568	C27	NPO 10PF	1
364569	C10, 24	NPO 15PF	2
260058	C103	NPO 30PF	1
364571	C104	NPO 51PF	1
364572	C3	NPO 82PF	1
265068	C4, 80	CERAMIC 100PF	2
364574	C11, 16, 17, 18, 19, 113, 116	CERAMIC 0.001μF	7
364575	C28, 108	CERAMIC 0.01μF	2
364576	C5, 6, 12, 13, 15, 25, 29, 32, 33, 34, 37, 38, 39, 40, 41, 44, 46, 48, 49, 51, 52, 82, 83, 84, 85, 90, 93, 94, 95, 96, 105, 106, 107, 113, 114, 118, 121, 128	CERAMIC 0.02μF	38
364577	C30, 50, 136	ELECT. 50V. 0.47μV	3
364578	C45, 56, 62, 72, 77, 78,,123, 124, 133, 137	ELECT. 50V. 1μF	10
364579	C129	ELECT. 50V. 3.3μF	1
364580	C60, 91, 92, 122, 125, 130	ELECT. 50V. 4.7μF	6

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
265046	C43, 53, 54, 127	ELECT. 35V. 10μF	4
812015	C81	ELECT. 16V. 22μF	1
265049	C75, 76	ELECT. 16V. 33μF	2
265041	C55, 126	ELECT. 16V. 47μF	2
265037	C47, 61, 109, 132	ELECT. 16V. 100μF	4
364678	C64	MYLAR 0.0015μF	1
265065	C70	MYLAR 0.0022μF	1
364680	C58, 59	MYLAR 0.0047μF	2
364681	C73, 74	MYLAR 0.0056μF	2
812156	C66, 79, 86, 89, 97, 101, 115, 117	MYLAR 0.01μF	8
812164	C20, 57, 87, 88, 98, 110, 111, 120	MYLAR 0.022μF	8
364684	C31, 119	MYLAR 0.033μF	2
265056	C63, 102	MYLAR 0.047μF	2
364699		LAPPING PIN W/BASE 2P	4
364700		LAPPING PIN W/BASE 3P	3
364701		LAPPING PIN W/BASE 4P	2
364702		LAPPING PIN W/BASE 1P	7
265156		JUMPER LEAD 12.5 m/m	14
		RESISTORS	
812088	R73, 74	RESISTOR 2/8W 22Ω (PL)	2
364614	R5, 16, 91, 92, 106	RESISTOR 2/8W 100Ω "	5
364615	R105	RESISTOR 2/8W 150Ω "	1
364616	R7, 9, 20, 87, 109	RESISTOR 2/8W 330Ω "	5
812081	R17	RESISTOR 2/8W 1KΩ "	1
812078	R111, 112	RESISTOR 2/8W 10KΩ "	2
364619	R37, 39	RESISTOR 2/8W 12KΩ "	2
812072	R6, 8, 10, 21, 93, 94	RESISTOR 2/8W 100KΩ "	6
364621	R88, 89	RESISTOR 2/8W 470KΩ "	2
364622	R2	RESISTOR 2/8W 47Ω (F)	1
364623	R25	RESISTOR 2/8W 56Ω "	1
364624	R15, 77, 80, 104, 119, 120, 121, 122, 123, 133, 136	RESISTOR 2/8W 100Ω "	11
364625	R115, 117, 137	RESISTOR 2/8W 220Ω "	3
364626	R28, 34	RESISTOR 2/8W 330Ω "	2
364627	R102	RESISTOR 2/8W 470Ω "	1
364628	R75	RESISTOR 2/8W 560Ω "	1
364629	R26	RESISTOR 2/8W 680Ω "	1
364630	R19, 38, 54, 58, 59, 60, 82, 86, 90, 110, 128, 134	RESISTOR 2/8W 1KΩ "	12
364631	R13, 46, 65, 66, 107	RESISTOR 2/8W 1.5KΩ "	5
364632	R135	RESISTOR 2/8W 1.8KΩ "	1
364633	R24, 41, 42, 67, 68, 85	RESISTOR 2/8W 2.2KΩ "	6
364634	R52	RESISTOR 2/8W 3.3KΩ "	1
364635	R11, 47, 118, 130, 131	RESISTOR 2/8W 4.7KΩ "	5
364636	R18, 55, 97, 98, 108, 114	RESISTOR 2/8W 5.6KΩ "	6
364637	R61	RESISTOR 2/8W 6.8KΩ "	1
364638	R44, 103	RESISTOR 2/8W 8.2KΩ "	2
364639	R23, 49, 53, 76	RESISTOR 2/8W 10KΩ "	4
364640	R22, 51	RESISTOR 2/8W 12KΩ "	2
364641	R125	RESISTOR 2/8W 15KΩ "	1
364642	R40, 83, 84, 127	RESISTOR 2/8W 18KΩ "	4
364643	R12, 95, 96, 124	RESISTOR 2/8W 22KΩ "	4
364644	R43, 45, 115	RESISTOR 2/8W 27KΩ (F)	3
364645	R57	RESISTOR 2/8W 33KΩ "	1
364646	R48, 50, 101, 129	RESISTOR 2/8W 47KΩ "	4
364647	R1, 3, 27, 36, 71, 72, 81, 113, 126	RESISTOR 2/8W 100KΩ "	9
364648	R56, 62	RESISTOR 2/8W 220KΩ "	2
364649	R99, 100	RESISTOR 2/8W 330KΩ "	2
364650	R35	RESISTOR 2/8W 470KΩ "	1
364651	R4, 132	RESISTOR 2/8W 1MΩ "	2
364652	R138	RESISTOR 2/8W 10Ω "	1
364653	R63, 64, 69, 70	RESISTOR 2/8W 3.9KΩ "	4
364654	R78	RESISTOR 2/8W 150KΩ "	1
364704		SHIELD PLATE	1
364705		SOCKET 5P	1
364503		PCB CPT-80H061	1
260138		PCB MOUNTING BRAKET (B)	3
		ICs	
364516	IC404	IC TC-4511 BP	1
364517	IC403	IC TD-6230IP	1
364518	IC401	IC TC-9125 BP	1
364519	IC405	IC TD-6102P	1
364520	IC402	IC TC-9129P	1
		TRANSISTORS	
364530	Q403, 404, 405, 406, 407, 408, 410, 412, 409, 413, 415, 416, 418	Tr. 2SC-458(B)	13
364531	Q411, 414, 417	Tr. 2SD-468(B)	3
364532	Q401	Tr. 2SC-461(B)	1
265014	Q402	Tr. 2SK-30A (O or Y)	1

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
		DIODES	
364536	D401, 402, 403, 404, 406, 407, 408 409, 410, 412, 413, 416, 418, 419 420, 421, 422, 424	DIODE 1S-1588	19
265023	D414, 415	DIODE S-5277 or WO-3C	2
260104	D417	ZENOR 05Z-5.1	1
364707	X401	CRISTAL 9.00 MHZ	1
364557	T401	COIL S-103-184	1
364708	L402, 404	MICRO INDUCTOR 10μH	2
364709	C401	CERAMIC TRIMMER 30PF	1
364586	C419, 420	STYROL 220PF	2
265062	C438, 439	MYLAR 0.018μF	2
		CAPACITORS	
265076	C413	CERAMIC 220PF	1
265067	C415, 416, 417, 422, 423, 424, 425, 434	CERAMIC 470PF	8
812174	C407, 412	CERAMIC 0.001μF	1
364591	C401	CERAMIC 0.0047μF	1
265074	C402, 404, 405, 406, 408, 427, 435, 436, 443	CERAMIC 0.01μF	9
364593	C414	CAPACITOR 0.02μF	1
364594	C410, 411	CAPACITOR NPO 39PF	2
364595	C442	CAPACITOR TANTAL 0.22μF	1
364596	C428 C418	ELECT. 0.47μF	1
364597	C421, 428, 430, 432	ELECT. 1μF	4
364598	C429, 431, 433	ELECT. 4.7μF	3
265046	C403, 426	ELECT. 35V 10μF	2
265038	C409, 440, 441	ELECT. 10V 100μF	3
364601	C437	ELECT. 10V 470μF	1
265156		JUMPER LEAD 12.5 mm	17
265153		LAPPING PIN	
364712		SHIELD	1
364713		SOCKET 4P	4
364714		SOCKET 5P	6
		RESISTORS	
364655	R436	RESISTOR 2/8W 12Ω (PL)	1
364656	R446, 447	RESISTOR 2/8W 39Ω "	2
364657	R437	RESISTOR 2/8W 15Ω (F)	1
364658	R444	RESISTOR 2/8W 10Ω "	1
364659	R413	RESISTOR 2/8W 680Ω "	1
364660	R415	RESISTOR 2/8W 1KΩ "	1
364661	R401	RESISTOR 2/8W 2.2KΩ "	1
364662	R440, 441	RESISTOR 2/8W 4.7KΩ "	2
364663	R419 R429	RESISTOR 2/8W 5.6KΩ "	1
364664	R403	RESISTOR 2/8W 6.8KΩ "	1
364665	R426, 432, 435	RESISTOR 2/8W 10KΩ "	3
364592	R448	RESISTOR 2/8W 56Ω "	1
364666	R414	RESISTOR 2/8W 15KΩ "	1
364667	R410, 411	RESISTOR 2/8W 27KΩ "	2
364668	R402	RESISTOR 2/8W 33KΩ "	1
364669	R412, 425	RESISTOR 2/8W 56KΩ "	2
364670	R404, 405, 406, 407, 408, 409, 416, 417, 418, 419, 420, 421, 422, 423, 424, 438, 439, 442, 443	RESISTOR 2/8W 100KΩ "	17
364590	R438, 439	RESISTOR 2/8W 68KΩ "	2
364599	R427, 428, 430, 431, 433, 434	RESISTOR 2/8W 47KΩ "	6
364600	R490, 491, 494, 492, 493	RESISTOR 2/8W 10KΩ (PL)	5
364505		PCB CPP-801014A	1
260138		PCB MOUNTING BRAKET (B)	4
265153		LAPPING PIN	2
364717		LAPPING PIN W/BASE 9P	1
364601	C301, 302, 303, 304, 307, 309 311, 315	CERAMIC 50 WV 0.01μF	8
364603	C305	CERAMIC 35 WV 2200μF	1
364604	C306, 308, 310	CERAMIC 25 WV 470μF	5
364605	C314	CERAMIC 10 WV 470μF	1
364634	R304	RESISTOR 2/8W 3.3KΩ	1
364674	R305	RESISTOR 1W 47Ω	1
364675	R301	RESISTOR 2W 10Ω	1
364676	R302, 303	RESISTOR 2W 11Ω	2
364538	D301	DIODE W-02	1
364521	Q302	IC HA-17807	1
364522	Q301	IC HA-17815 (HA-17818)	1
265156		JUMPER LEAD 12.5 mm	2
364507		PCB CPT-80E060	1
265156		JUMPER LEAD 12.5 mm	17
364639	D101-D109	DIODE TLR-124	9
364723	S101-S114	TACT SWITCH	14
364508		PCB CPT-80E059-1	1
364509		PCB CPT-80E059-2	1
364510		PCB CPT-80E059-3	1
364677	R201	RESISTOR 2/8W 47Ω	1
364540	D201-D204	DIODE GL-9PR2	4
364541	D205-D209	DIODE GL-9NG2	5
364542	D210-D214	DIODE GL-8N03D	5

EXPLODED VIEW PARTS

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
364726	1	FRONT PANEL	1
364727	2	CHASSIS FRAME	1
364728	3	REAR PANEL	1
364729	4	COVER, BOTTOM	1
265215	5	DISPLAY, PLATE	1
265216	6	ACRYL, DISPLAY	1
265210	7	LED DISPLAY CASE	1
265226	8	ACRYL, PANEL	1
265211	9	FOOT No. 7102	4
265224	10	PUSH KNOB (T,L) (G)	2
265221	11	PUSH KNOB (P,L) (B)	1
265223	12	PUSH KNOB (T,M) (F)	3
265222	13	PUSH KNOB (T,S) (E)	9
265220	14	PUSH KNOB (P,S) (A)	3
260138	15	BRACKET, P.C.B.	10
265206	16	BRACKET, POWER SW	1
364742	17	INSULATION, CORD TERMINAL	1
364704	18	SHIELD PLATE	1
265207	19	BRACKET, DIN JACK	1
364744	20	HEAT SINK	1
364745	21	BRACKET, BATTERY CASE	1
364746	22	COVER, BATTERY CASE	1
265230	23	SHAFT, POWER SW	1
265237	24	STOPPER, SHAFT	1
265217	25	BONNET	1
265219	26	LED GUIDE	1
364751	27	RIBBON	1
364753	28	DECRATION SCREW	2
265189	29	STOPPER, AC CORD	1
364501	30	P.C.B, CPT-80H062	1
364507	31	P.C.B, CPT-80E060	1
364763	32	FUSE 250V 800mA	1
364503	33	P.C.B, CPT-80H061	1
364505	34	P.C.B, CPP-801014-B	1
364508	35	P.C.B, CPT-80E059-1	1
364509	36	P.C.B, CPT-80E059-2	1
364510	37	P.C.B, CPT-80E059-3	1
364501	38	P.C.B, CPT-80H062	1
364754	39	CORD TERMINAL	1
364755	40	POWER XFORMER	1
364756	41	PUSH SW SUF32A62	1
265185	42	POWER SW SDS-3P	1
364698	43	DIN JACK 7P	2
364758	44	ANTENNA TERMINAL	1
364759	45	BAR ANTENNA	1
364760	46	BATTERY CASE	1
364761	47	RCA PIN PLUG	1
265188	48	AC CORD	1
		MISCELLANEOUS	
364765		EARTH LUG 3φ	1
265195		TUBE 1.0φ 8mm	2
364767		UL TUBE 3.2φ 40mm	2
364768		BATTERY UM-3X3	1
364769		FM ANTENNA	1
364770		GIFT BOX	1
364771		INSTRUCTION MANUAL	1
265199		TENSAI CERTIFICATE	1
265197		POLY BAG	1
265200		SNOW BOX	2
812775		FUSE LABEL	1
265193		BINDER LEAD	20
364744		RIBBON	1

5. TFL812 (Cassette Deck)

5—1 SPECIFICATIONS

Tape System:	4-track, 2-channel Stereo System
Tape Speed:	1-7/8 ips (4.75 cm/s)
Frequency Response (REC/Playback):	20 Hz — 16,000 Hz
S/N Improvement by HIGH COM NR:	20 dB
S/N Ratio (REC/Playback):	50 dB
Wow & Flutter (Playback, JIS):	0.06%
Record Bias Frequency:	approx. 100 kHz
Distortion (REC/Playback):	1.0%
Cross Talk:	
between channel:	45 dB
between track:	65 dB
Input Sensitivity & Impedance	
Line Input:	70 mV, 100 kΩ
Mic Input:	−70 dBm, 10 kΩ
DIN Input:	−70 dBm, 3.3 kΩ
Output Level & Load Impedance	
Line Output:	580 mV, 4.7 kΩ
Headphone Output:	0.25 mW, 8Ω
Erase Effect (Chrome):	70 dB
Power Consumption:	18W
Weight:	7.0 kg
Dimension (WHD):	430 × 105 × 250 mm

Our policy is one of continuous development of our products and we may change specifications without notice.

5—2 ALIGNMENT

TFL-812 CASSETTE DECK ALIGNMENT PROCEDURES

1) **Adjustment of playback level**
Adjust VR1 (L) and VR2 (R) so that the output may become 600 mV. Use DOLBY test tape, 200 mW/b. The position of VR402 should be at its maximum.

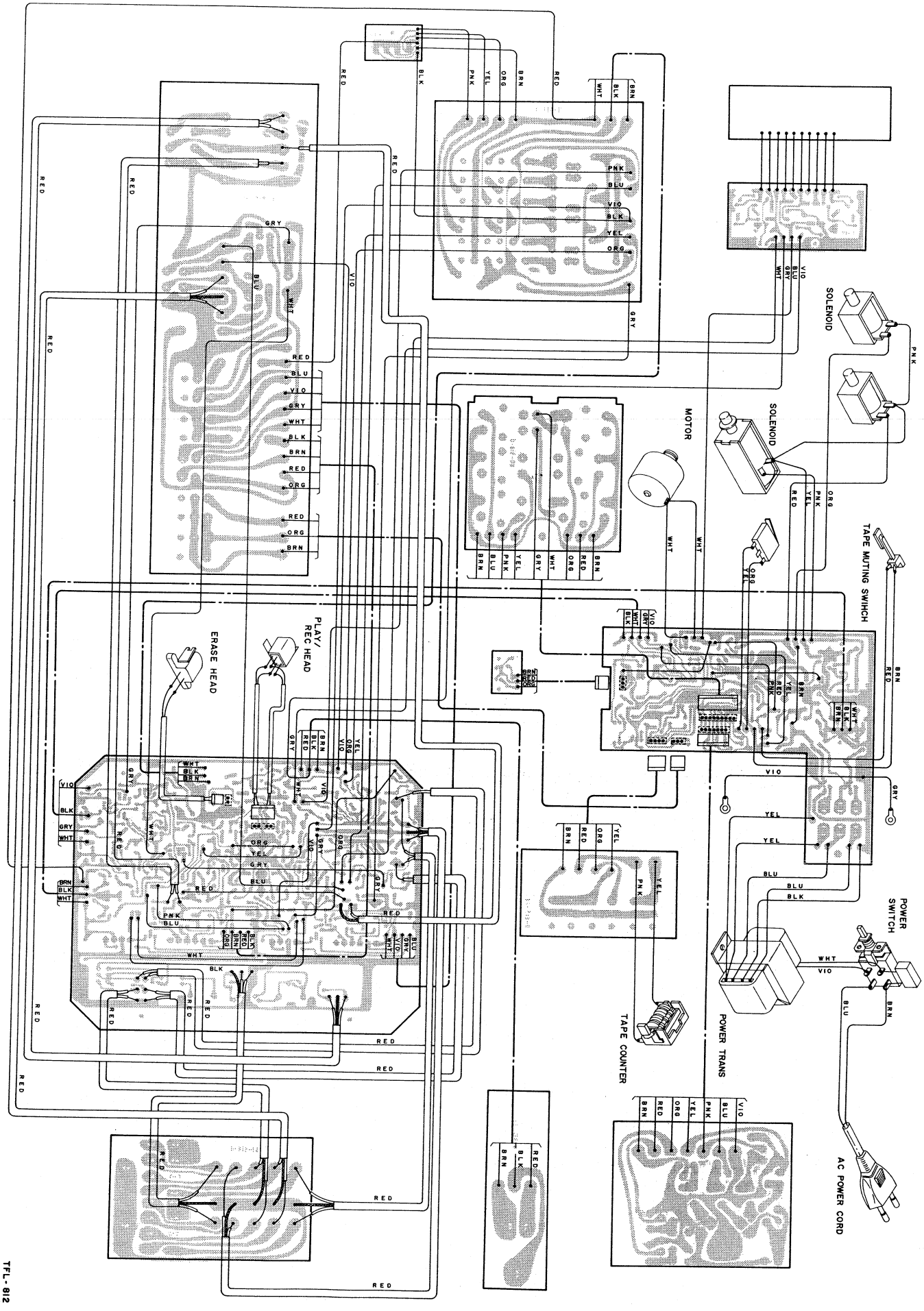
2) **Adjustment of meter level**
Adjust the meter level by VR401 so that the output from LINE OUT may become 420 mV when the signal is added the LINE IN, adjust the level by VR403 of the level meter so that 0 dB on the LED meter indicator may be lit up. The methods of the adjustment of the left and the right side of meter are the same. Then, check each level by rotating VR402.

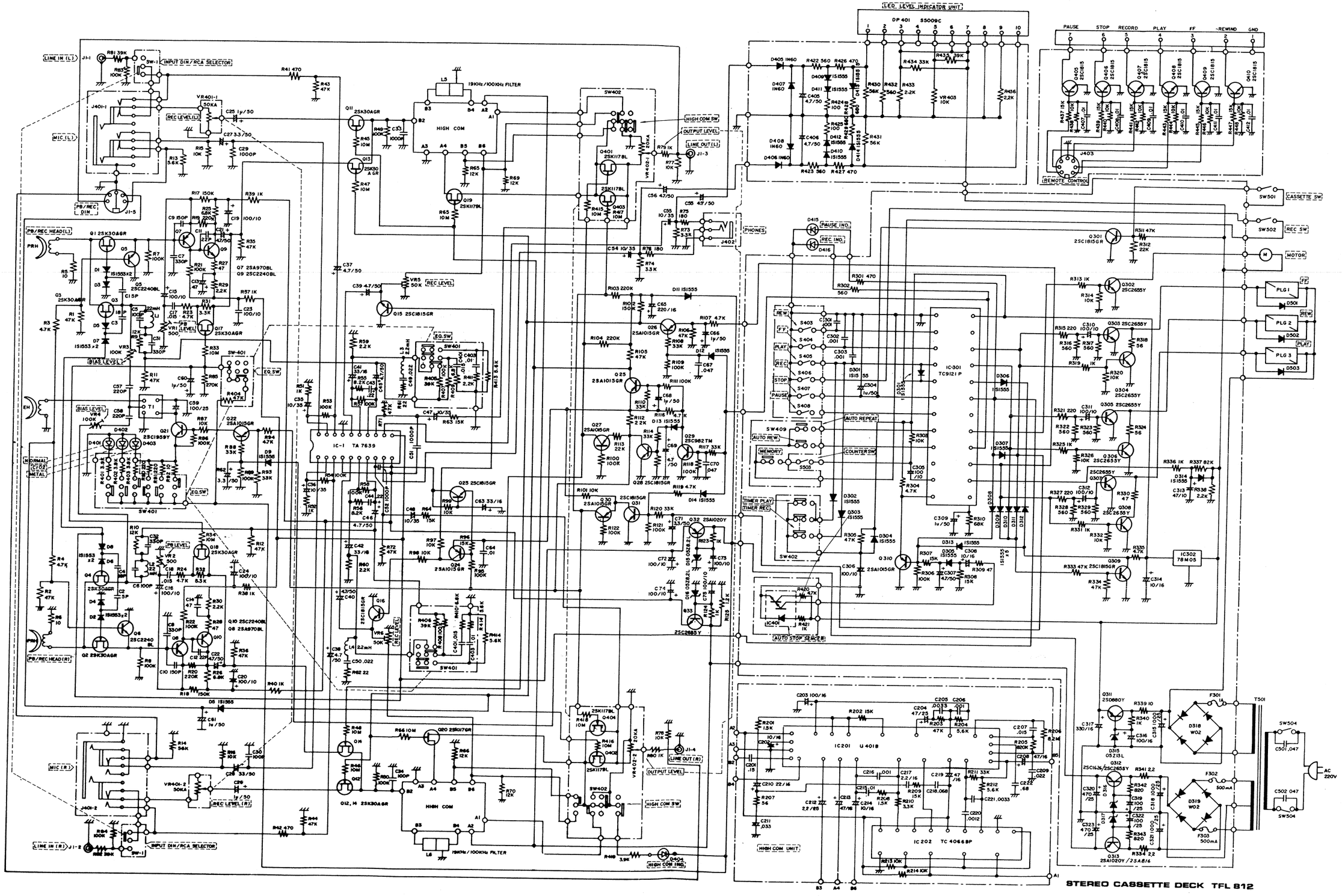
3) **Adjustment of leakage of bias**
With cassette switches at recording condition, adjust L1 (L) and L2 (R) so that the voltage of TP3 (L) and TP4 (R) may become minimum. Use volt meter for adjustment.

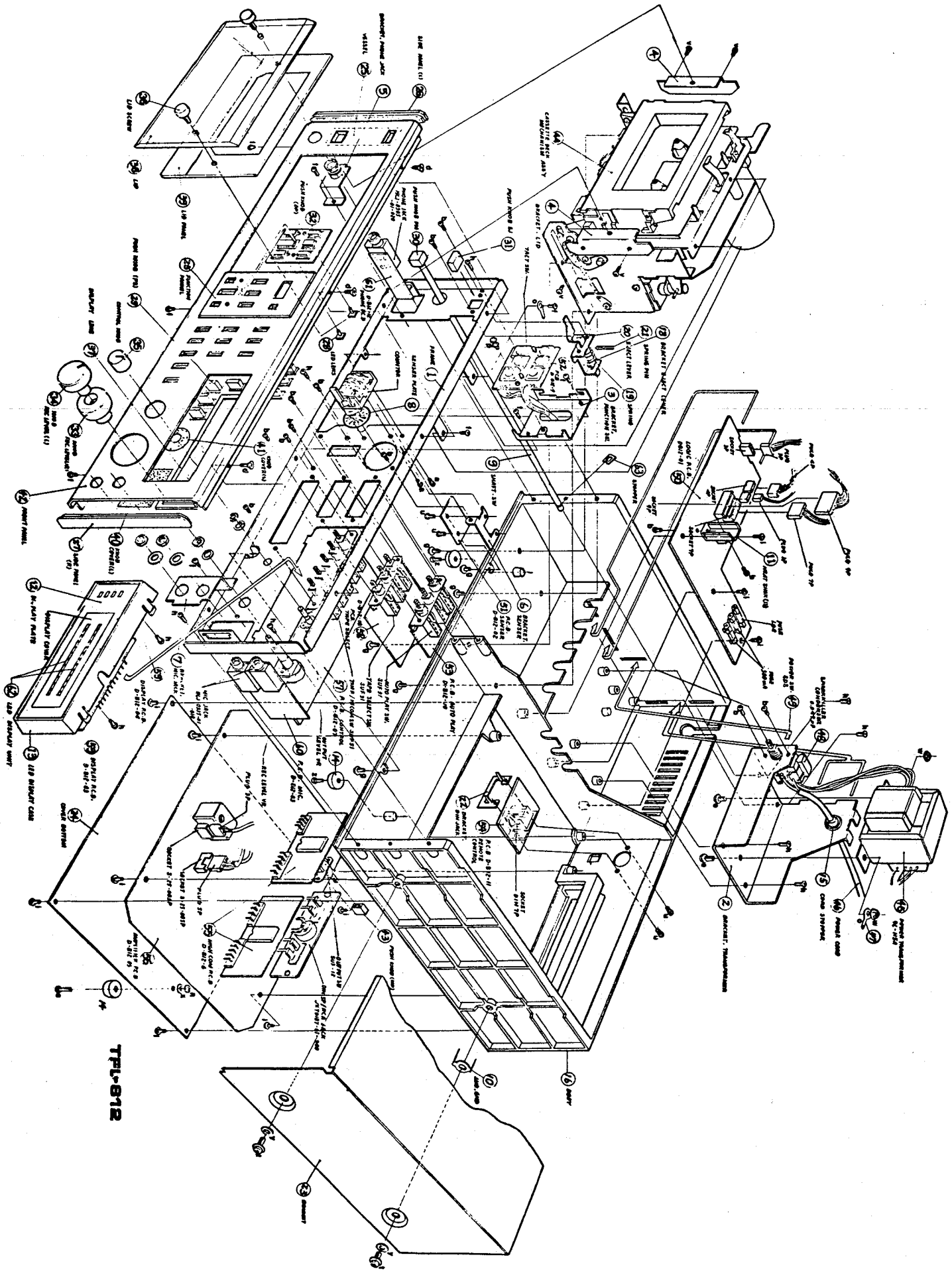
4) **Adjustment of recording level**
Set the VR3 (L) and VR4 (R) at any position. With cassette switch at recording condition, apply appoximately 1000 HZ 100 mV to LINE IN. Then adjust the level to the voltage of LINE OUT by VR401 (L, R). Start recording or playback after the adjustment of VR5 (L) and VR6 (R) so that the output of the LINE OUT has the same voltage at the record and play modes. Check each tape by the same procedure.

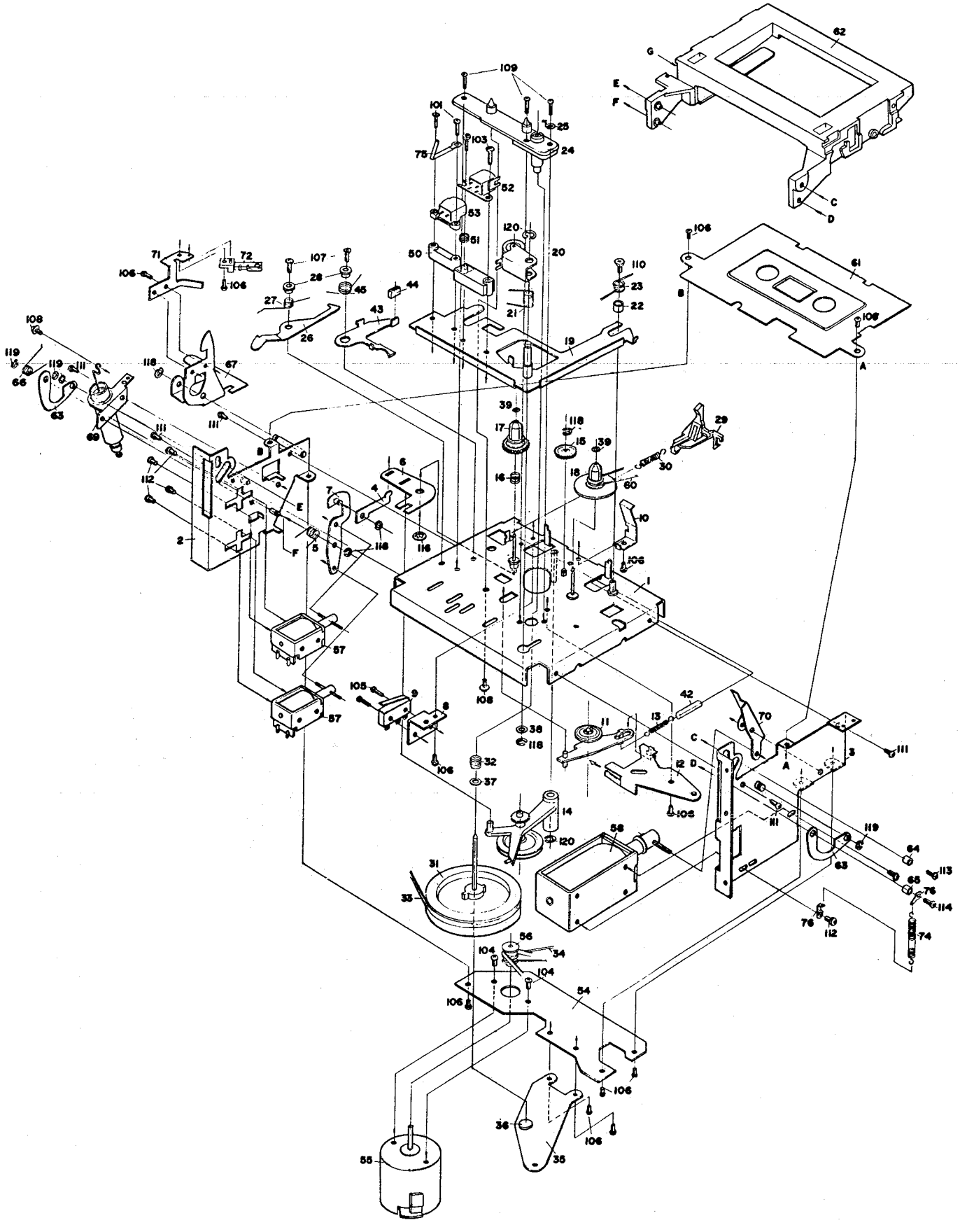
5) **Adjustment of bias**
With the cassette switch at recording condition, adjust VR401 (L, R) so that the motor output may become −20 dB at 420 mV, and repeat recording and playback so that of the figures of the frequency response should be within specifications. Measure the distortion by 0 dB VU level.

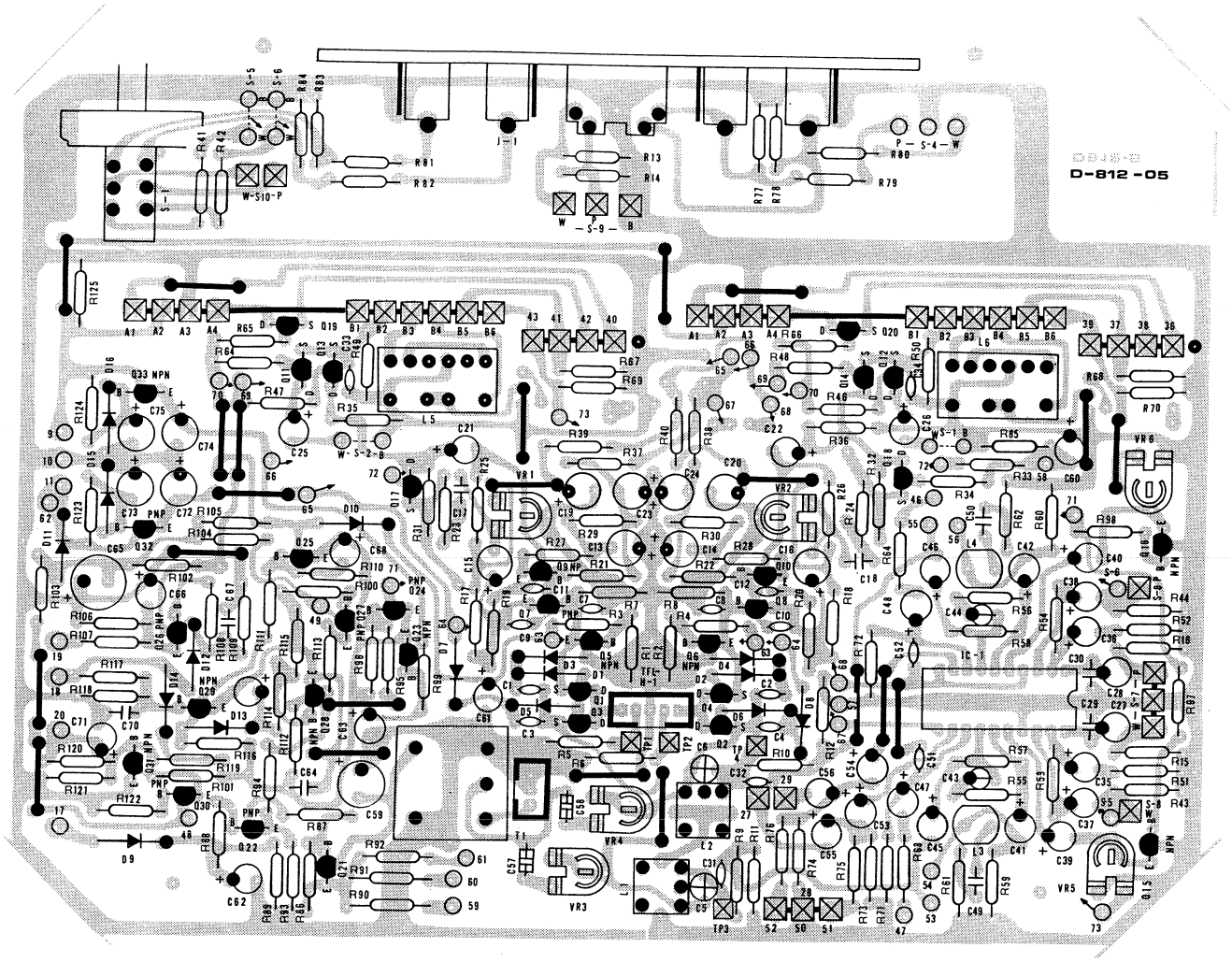
6) **Bias frequency**
The bias frequency should be within 100 KHZ plus/minus 10 %.
Adjust TP3 on TP4 by T1 and measure the value.

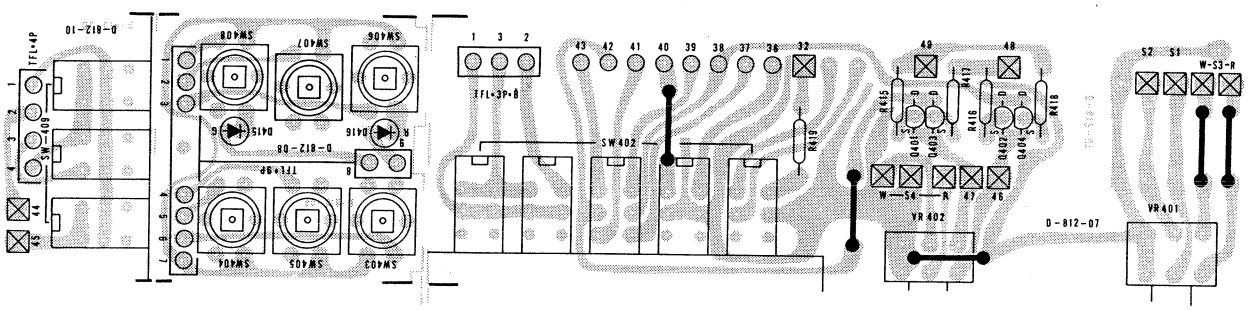

SOLENOID
SOLENOID
MOTOR
TAPE MUTING SWITCH
ERASE HEAD
PLAY/
REC HEAD
POWER
SWITCH
TAPE COUNTER
POWER TRANS
AC POWER CORD

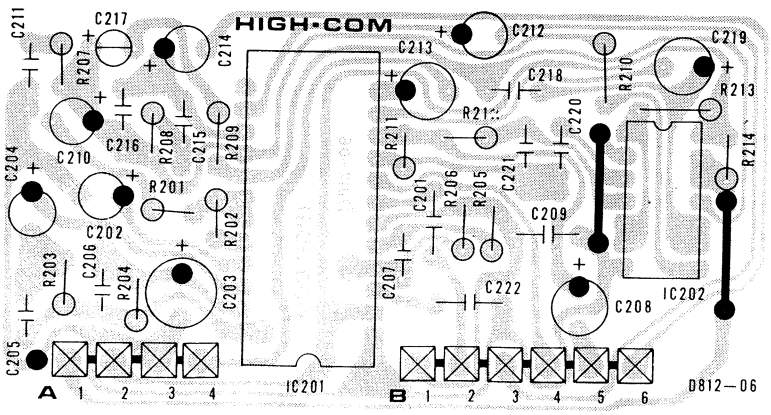

LINE IN (L)
INPUT DIN/RCA SELECTOR
REC LEVEL (L)
MIC (L)
PB/REC DIN
PB/REC HEAD (L)
BIAS LEVEL
EQ.SW
NORMAL (CrO2) METAL
PB LEVEL
REC LEVEL
19KHz/100KHz FILTER
HIGH COM
HIGH COM SW
OUTPUT LEVEL
LINE OUT (L)
REC LEVEL
IC-1 TA 7639
LINE IN (R)
MIC (R)
REC LEVEL (R)
LINE OUT (R)
HIGH COM UNIT
LED LEVEL INDICATOR UNIT
DP 401 S5009C
PAUSE
STOP
RECORD
PLAY
FF
REWIND
GND
REMOTE CONTROL
PHONES
PAUSE IND.
REC IND.
REW
FF
PLAY
REC
STOP
PAUSE
AUTO REPEAT
SW409
AUTO REW.
MEMORY
COUNTER SW
TIMER PLAY
TIMER REC
AUTO STOP SENSER
IC-301 TC9121P
IC201 U 4018
IC 202 TC 4066BP
IC302 78M05
CASSETTE SW
REC SW
MOTOR
AC 220V
STEREO CASSETTE DECK TFL 812

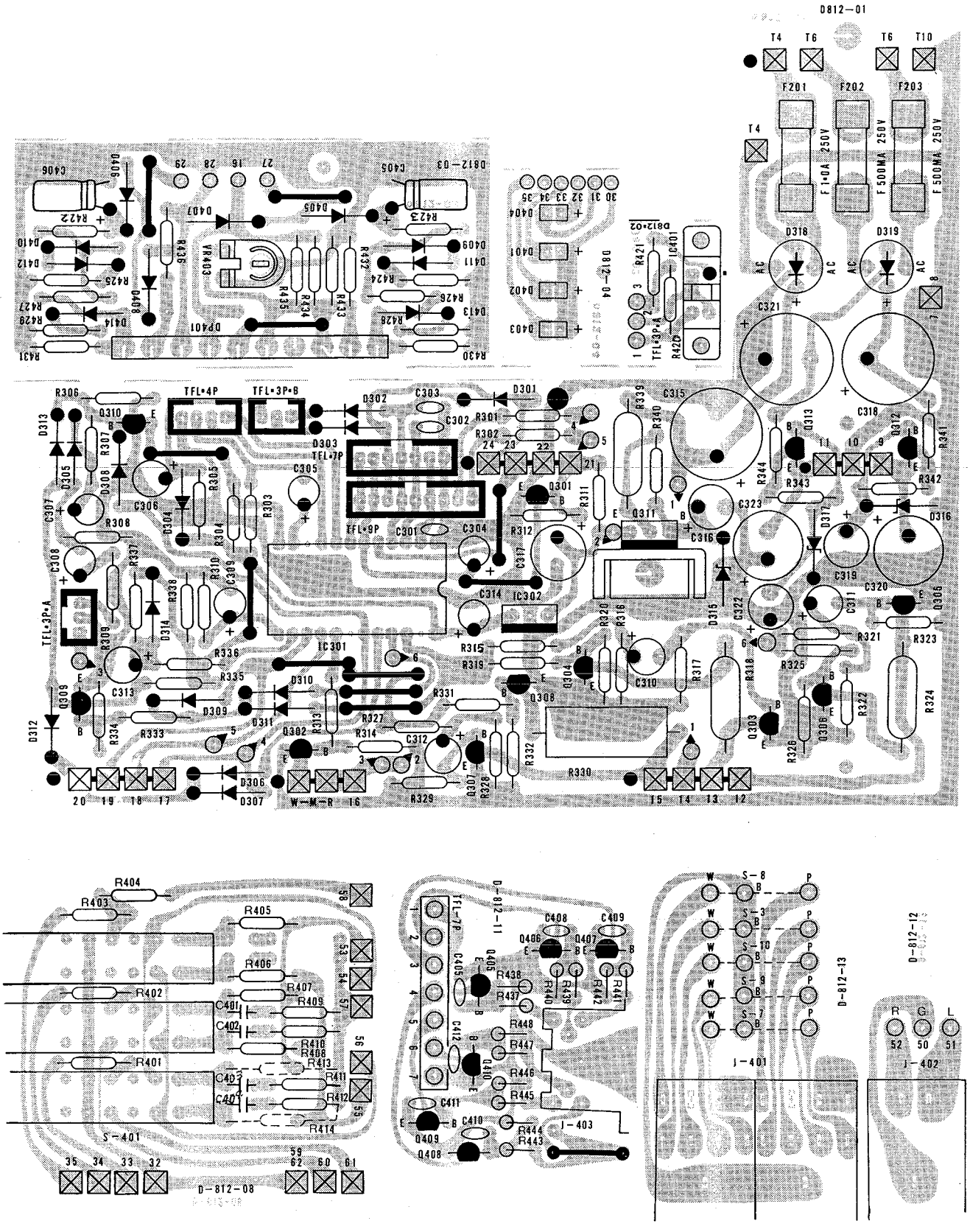

TFL-812




D-812-05


D-812-07


HIGH-COM
D812－06


D812-01
T4
T6
T6
T10
F201
F202
F203
F1.0A 250V
F500MA 250V
F500MA 250V
D318
D319
C321
C318
C315
C323
C322
C320
C319
C316
C317
IC302
IC301
TFL-4P
TFL-3P-B
TFL-9P
TFL-3P-A
D812-02
D812-03
D812-04
W-M-R
D-812-08
D-812-11
D-812-12
D-812-13
J-401
J-402
J-403
S-401

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
POWER SECTION			
812165	T501 , 9L-115A	POWER TRANSFORMER	1
265185	SW504	POWER SWITCH SDS-3P	1
265189		CORD STOPPER 4K4	1
265180	C501, 502	SPARKKILLER 0.047μF 250V	2
265188		POWER CORD	1
812170		LUG 4φ	1
LOGIC SECTION			
812171		PCB D-812-01	1
812172	IC301	IC TC9121P	1
265011	Q311	TR 2SD 880 (Y)	1
812047	Q302, 303, 304, 305, 306, 307, 308	TR 2SC 2655 (Y)	1
812048	Q312	TR 2SC 1626 (Y)	1
812050	Q301, 309	TR 2SC 1815 (GR)	2
812173	IC302	78M05	1
812061	D318, 319	DIODE W02 8005	2
265024	D301, 302, 303, 304, 305, 312, 313, 314, 306, 307, 308, 309, 310, 311	DIODE 1S1555	14
812063	D316, 317	ZENOR DIODE 05Z-15U	2
265032	D315	ZENOR DIODE 05Z-13L	1
		CAPACITORS	
812028	C315, 318, C321	CAPACITOR ELECT. 1000μF 25V	3
812029	C320, 323	CAPACITOR ELECT. 470μF 25V	2
812030	C317	CAPACITOR ELECT. 330μF 16V	1
812031	C319, 322	CAPACITOR ELECT. 100μF 25V	2
265037	C316	CAPACITOR ELECT. 100μF 16V	1
265038	C305, 306, 310, 311, 312	CAPACITOR ELECT. 100μF 10V	5
812034	C313	CAPACITOR ELECT. 47μF 10V	1
812035	C308, 314	CAPACITOR ELECT. 10μF 16V	2
265044	C307	CAPACITOR ELECT. 4.7μF 50V	1
265042	C304, 309	CAPACITOR ELECT. 1μF 50V	2
812174	C301, 302, 303	CERAMIC 0.001μF 50V	3
		RESISTORS	
812070	R330	RESISTOR 47Ω 5W	1
812071	R318, 324	" 56Ω 2W	2
812072	R306	" 100KΩ 2/8W(PL)	1
812073	R337	" 82KΩ 2/8W(PL)	1
812074	R310	" 68KΩ 2/8W(PL)	1
812075	R305, 311, 333, 334	" 47KΩ 2/8W(PL)	4
812076	R312	" 22KΩ 2/8W(PL)	1
812077	R307, 308	" 15KΩ 2/8W(PL)	2
812078	R303, 314, 320, 326, 332	" 10KΩ 2/8W(PL)	5
812079	R304, 335	" 47KΩ 2/8W(PL)	2
812080	R338	" 2.2KΩ 2/8W(PL)	1
812081	R313, 319, 325, 331, 336, 340	" 1KΩ 2/8W(PL)	6
812082	R342, 343	" 820Ω 2/8W(PL)	2
812083	R302, 316, 317, 323, 328, 329, 322	" 560Ω 2/8W(PL)	7
812084	R301	" 470Ω 2/8W(PL)	1
812085	R315, 321, 327	" 220Ω 2/8W(PL)	3
812086	R309	" 47Ω 2/8W(PL)	1
812087	R341, 344	" 22Ω 2/8W(PL)	2
812088	R339	" 10Ω 2W	1
265150		FUSE HOLDER 5φ	6
812151	F302, 203	FUSE 500mA F	2
812152	F201	FUSE 1A F	1
812175		HEAT SINK (SMALL)	1
265195		TUBE 1φ x 8 m/m	12
812146		CONNECTOR SOCKET S-25-009P	1
812147		CONNECTOR SOCKET S-25-007P	1
812148		CONNECTOR SOCKET S-25-004P	1
812149		CONNECTOR SOCKET S-25-003P	2
812177		LAPPING PIN W/BASE (4 SERIES)	3
812178		LAPPING PIN W/BASE (3 SERIES)	2
265153		LAPPING PIN	6
265156		JUMPER LEAD 12.5 m/m	8
MECHANISM SEPTION		MECHANISM ASSY FIT-20-10	1
265023	D501, 502, 503	DIODE S5277	3
812181		CONNECTOR LEAD FTL-H-1	1
812182		CONNECTOR LEAD FTL-H-2	1
812183		LUG 3φ	1
AUTO SENSOR SECTION			
812002		PCB D-812-02	1
812184	IC-401	HOT CAPLER TLP-507A	1
812089	R420	RESISTOR 47KΩ 2/8W	1
812090	R421	RESISTOR 1KΩ 2/8W	1
812185		CONNECTOR LEAD TEL-3P	1
DECK SELECTOR SECTION			
812003		PCB D-812-9	1
812186	SW403, 404, 405, 406, 407, 408	TACT SWITCH	6
265163	D416	LED TLR-124	1
812188	D415	LED TLG-124	1
812189		CONNECTOR LEAD TFL-9P	1
AUTO PLAY SECTION			
812004		PCB D-812-10	1
812190	SW409	PUSH SWITCH SUF31 (3 SERIES)	1
265153		LAPPING PIN	2
812192		CONNECTOR LEAD TFL-4P	1

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
REMOTE CONTROL SECTION			
812005		PCB D-812-11	1
265173	J403	DIN SOCKET TCS 4670-01-111	1
812052	Q405, 406, 407, 408, 409, 410	TR 2SC 1815 (GR)	6
265074	C407, 408, 409, 410, 411, 412	CERAMIC 0.01μF 50V	6
812091	R437, 439, 441, 443, 445, 447	RESISTOR 15KΩ 2/8W	6
812092	R438, 440, 442, 444, 446, 448	RESISTOR 10KΩ 2/8W	6
812195		CONNECTOR LEAD TFL-7P	1
265156		JUMPER LEAD 12.5 mm	2
812093		RESISTOR 22Ω	1
HIGH-COM SECTION			
812006		PCB D-812-6	2
812197	IC201	IC U401B	2
812198	IC202	IC TC 4066BP	2
		CAPACITORS	
812013	C203	ELECT. CAPACITOR 100μF 16V	2
812014	C208, C213, 219	ELECT. CAPACITOR 47μF 16V	6
812015	C210	ELECT. CAPACITOR 22μF 16V	2
812016	C202, C214	ELECT. CAPACITOR 10μF 16V	4
812017	C204	ELECT. CAPACITOR 4.7μF 25V	2
812018	C212	ELECT. CAPACITOR 2.2μF 25V	2
	C217	TANTAL 2.2μF 16V	2
812153	C206, 216	MYLAR 0.001μF 50V	4
812154	C220	MYLAR 0.0012μF 50V	2
812155	C205, 221	MYLAR 0.0033μF 50V	4
812156	C215	MYLAR 0.01μF	2
812157	C207	MYLAR 0.015μF	2
812158	C211	MYLAR 0.033μF	2
812159	C218	MYLAR 0.068μF	2
812199	C201	MKH CAPACITOR 0.15μF 100V	2
812200	C209	MKH CAPACITOR 0.22μF 100V	2
812201	C222	MKH CAPACITOR 0.68μF 100V	
		RESISTORS	
812094	R201, 208	1.5KΩ ±2%	4
812095	R210	3.3KΩ ±2%	2
812096	R207	56Ω ±5%	2
812097	R213, 214	10KΩ ±5%	4
812098	R206	8.2MΩ ±5%	2
812099	R204, 212	5.6KΩ ±2%	4
812100	R202, 209	15KΩ ±2%	4
812101	R211	33KΩ ±2%	2
812102	R203	47KΩ ±2%	2
812103	R205	820KΩ ±2%	2
812202		CONNECTOR 4P	2
812203		CONNECTOR 6P	2
265156		JUMPER LEAD 12.5 mm	4
MAIN AMP SECTION			
812007		PCB D-812-05	1
812205	IC-1	IC TA7639P	1
		TRANSISTORS	
265014	Q1, 2, 3, 4, 11, 12, 13, 14, 17, 18	FET 2SK 30A GR	10
812207	Q19, 20	FET 2SK 117 (BL)	2
812053	Q5, 6, 9, 10	TR 2SC 2240 (BL)	4
812054	Q7, 8	TR 2SA 970 (BL)	2
812055	Q15, 16, 23, 28, 31	TR 2SC 1815 (GR)	5
812056	Q22, 24, 25, 26, 27, 30	TR 2SA 1015 (GR)	6
812057	Q21	TR 2SC 1959 (GR)	1
812058	Q29	TR 2SC 982 TM	1
812059	Q33	TR 2SC 2665 Y	1
812060	A32	TR 2SA 1020 Y	1
812066	D1, 2, 3, 4, 5, 6, 7, 8	DIODE 1S-1553	8
265024	D9, 10, 11, 12, 13, 14	DIODE 1S-1555	6
812208	D15, 16	ZENOR 05Z-8.2L	2
812209	T1	OSO BLOCK S103190	1
812210	L5, 6	MPX FILTER FB2200A	2
812211	L1, 2	FILTER COIL 22mH 10 mm	2
812212	L3, 4	MICROINDUCTOR 2.2 mH RC875-222J	2
812213	VR3, 4	SEMI FIXED RES. 100KΩ	2
812214	VR5, 6	SEMI FIXED RES. 50KΩ	2
812215	VR1, 2	SEMI FIXED RES. 500Ω	2
812216	J1	JACK BOARD JXT0187-01-540	1
812217			
812218		CONNECTOR SOCKET S-25-003P	1
812219		CONNECTOR SOCKET S-25-005P	1
		CAPACITORS	
812019	C65	ELECT. CAPACITOR 220μF 25V	1
812020	C59	" 100μF 25V	1
265038	C15, 16, 19, 20, 23, 24, 72, 73, 74, 75	" 100μF 10V	10
265041	C13, 14	" 47μF 16V	2
265049	C63, 41, 42	" 33μF 16V	3
265046	C35, 36, 47, 48, 53, 54	" 10μF 35V	6
265044	C21, 22, 37, 38, 39, 40, 45, 46, 55, 56, 69	" 4.7μF 50V	11
265051	C27, 28, 62, 71	" 3.3μF 50V	4
265042	C25, 26, 60, 61, 66, 68	" 1μF 50V	6

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
		RESISTORS	
812104	R33, 34, 45, 46, 47, 48, 65, 66,	RESISTOR 10MΩ 2/8W	8
812105	R85	RESISTOR 270KΩ 2/8W	1
812106	R19, 20, 103, 104	RESISTOR 220KΩ 2/8W	4
812107	R17, 18, 102	RESISTOR 150KΩ 2/8W	3
812108	R7, 8, 21, 22, 49, 50, 53, 54, 57, 58, 83, 84, 86, 89, 95, 100, 109, 118, 121, 122	RESISTOR 100KΩ 2/8W	21
812109	R1, 2, 11, 12, 35, 36, 43, 44, 71, 72 105, 106, 115	RESISTOR 47KΩ 2/8W	13
812110	R81, 82	RESISTOR 39KΩ 2/8W	2
812111	R88, 93, 108, 110, 114, 117, 120	RESISTOR 33KΩ 2/8W	7
812112	R113	RESISTOR 22KΩ 2/8W	1
812113	R63, 64, 96	RESISTOR 15KΩ 2/8W	3
812114	R9, 10, 67, 68, 69, 70	" 12KΩ 2/8W	6
812115	R15, 16, 77, 78, 87, 97, 98, 99 101	" 10KΩ 2/8W	9
812116	R25, 26	" 6.8KΩ 2/8W	2
812117	R13, 14	" 5.6KΩ 2/8W	2
812118	R3, 4, 23, 24, 94, 107, 116, 119	" 4.7KΩ 2/8W	8
812119	R31, 32, 73, 74	" 3.3KΩ 2/8W	4
812120	R29, 30, 59, 60, 112	" 2.2KΩ 2/8W	5
812121	R37, 38, 39, 40, 51, 52, 79, 80, 123, 124	" 1KΩ 2/8W	10
812122	R41, 42	" 470Ω 2/8W	2
812123	R75, 76	" 180Ω 2/8W	2
812124	R27, 28	" 47Ω 2/8W	2
812125	R61, 62	" 22Ω 2/8W	2
812126	R5, 6, 92	" 10Ω 2/8W	3
812127	R125	" 1.2KΩ 2/8W	1
812128	R55, 56	" 8.2KΩ 2/8W	2
812129	R91	" 220Ω 1/2W	1
812130	R90	" 220Ω 1/2W	1
		CAPACITORS	
812160	C29, 30	MYLAR 0.001μF 50V	2
812161	C64	" 0.01μF 50V	1
812162	C17, 18	" 0.015μF 50V	2
265060	C67, 70	" 0.047μF 50V	2
812164	C49, 50	" 0.022μF 50V	2
812038	C11, 12	CERAMIC 22PF 50V	2
265075	C33, 34	" 100PF 50V	2
812040	C9, 10	" 150PF 50V	2
812041	C7, 8	" 330PF 50V	2
812042	C51, 52	" 0.001μF 50V	2
812043	C31, 32	" 330PF 10% 100V	2
812044	C3, 4	" 18PF 10% 100V	2
812045	C1, 2	" 5PF 10% 100V	2
812220	C5, 6	STYROL 100PF 125V	2
812221	C43, 44	TANTAL 0.22μF 16V	2
812222	C57, 58	MICA 220PF 500V	2
812223	S1	PUSH SWITCH SUF12 (SINGLE)	1

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
812224		LAPPING PIN W/BASE (4 SERIES)	2
812225		LAPPING PIN W/BASE (3 SERIES)	2
812226		LAPPING PIN W/BASE (3 SERIES)	13
265156		JUMPER LEAD 12.5 m/m	22
SELECTOR SECTION			
812008		PCB D-812-07	1
812228	S402	PUSH SWITCH SUF51	1
812229	VR401	VR 50KAX2	1
812230	VR402	VR 20KAX2	1
812231	Q401, 402, 403, 404	FET 2SK 117 (BL)	4
812231	R415, 416, 417, 418	RESISTOR 10MΩ 2/8W	4
812232	R419	RESISTOR 3.9KΩ 2/8W	1
812232		CONNECTOR LEAD TFL-3P	1
812233		JUMPER LEAD 12.5 m/m	4
265153		LAPPING PIN	13
REC EQ SECTION			
812009		PCB D-812-08	1
	S401	PUSH SWITCH SUF 31	1
812133	R405, 406	RESISTOR 39KΩ 2/8W	2
812134	R404	" 47KΩ 2/8W	1
812135	R407, 408	" 100KΩ 2/8W	2
812136	R401, 402, 403	" 29KΩ 2/8W	3
812137	R413, 414	" 5.6KΩ 2/8W	2
265153		LAPPING PIN	12
LED DISPLAY SECTION			
812010		PCB D-812-03	1
		PCB D-812-04	1
265180	DP401	LED SET S-5009C	1
812068	D405, 406, 407, 408	DIODE 1N-60	4
812069	D409, 410, 412, 413, 414	DIODE 1S-1555	6
265181	D401, 402, 403, 404	LED GL-9PR2	4
812239	C405, 406	ELECT. 4.7mF/50	2
812240	UR403	SEMI FIXED RES. 10KΩ	1
812138	R424, 425	RESISTOR 100Ω 2/8W	2
812139	R426, 427	" 470Ω 2/8W	2
812140	R422, 423, 432	" 560Ω 2/8W	3
812141	R433, 436	" 2.2KΩ 2/8W	2
812142	R434	" 33KΩ 2/8W	1
812143	R435	" 39KΩ 2/8W	1
812144	R430, 431	" 56KΩ	2
812145	R428, 429	" 680Ω	2
265156		JUMPER LEAD 12.5 m/m	3
MIC SECTION			
812011		PCB D-812-13	1
812242	J401	MIC JACK HLJ0335-01-010	1
HEADPHONE SECTION			
812012		PCB D-812-12	1
265176	J402	HP JACK HLJ0305-01-020	1

EXPLODED VIEW PARTS

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
812254	1	FRONT FLAME	1
812255	2	FLAME, POWER TRANSFORMER	1
812256	3	FLAME, FUNCTION	1
812257	4	BRACKET, LID	2
265208	5	HD FLAME (HEADPHONE)	1
812259	6	BRACKET, SENSOR	1
812260	7	MJ FLAME (MIC JACK)	1
812261	8	SENSOR PLATE	1
265230	9	SHAFT, POWER SW	1
812263	10	EARTH LUG	1
265209	11	HEAT SINK	1
265215	12	LED PLATE (DISPLAY)	1
265210	13	LED CASE (DISPLAY)	1
265211	14	FOOT No. 7102	3
265189	15	CORD STOPPER 4K-4	1
812270	16	CHASSIS FLAME	1
265216	17	LED ACRYL	1
812272	18	BRACKET, EJECT SW	1
812273	19	SPRING, EJECT SW	1
812267	20	EJECT SW	1
812297	21	SPRING PIN, EJECT SW	1
265207	22	SOCKET MOUNTING BRACKET	1
812275	23	BONNET	1
812276	24	BOTTOM PLATE	1
812277	25	FUNCTION PANEL	1
812278	26	VESSEL	1
812279	27	SASH SIDE (L)	1
812280		SASH SIDE (R)	1
265219	28	LED GUIDE	2
265220	29	PUSH KNOB (A)	11
265221	30	PUSH KNOB (B)	1

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
812284	31	PUSH KNOB (C)	1
812285	32	FUNCTION KNOBS	1
812286	33	LEVEL KNOB (RIGHT)	1
812287	34	LEVEL KNOB (LEFT)	1
265229	35	OUTPUT LEVEL KNOB	1
812289	36	KNOB, LID	2
265226	37	ACRYL, PANEL	1
812291	38	ACRYL, LID	1
812292	39	LID PANEL	1
812293	40	KNOB COVER (L)	1
812294	41	KNOB COVER (S)	1
812295	42	FRONT PANEL	1
812296	43	PUSH KNOB (B), INPUT	1
812298	44	MECHANISM ASS'Y	1
812165	45	POWER XFORMER	1
265188	46	AC POWER CORD	1
812170	47	LUG 4φ	1
812168	48	SPARK KILLER 0.047μF	1
812166	49	POWER SW	1
812171	50	PCB, D-812-01	1
812002	51	PCB, D-812-02	1
812003	52	PCB, D-812-09	1
812004	53	PCB, D-812-10	1
812005	54	PCB, D-812-11	1
812006	55	PCB, D-812-06	2
812007	56	PCB, D-812-05	1
812008	57	PCB, D-812-07	1
812009	58	PCB, D-812-08	1
812010	59	PCB, D-812-03, 04	1
812011	60	PCB, D-812-13	1
812012	61	PCB, D-812-12	1
812237	62	LED DISPLAY UNIT	1
265237	63	STOPPER; SHAFT	1

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
		MISCELLANEOUS	
265193		BINDER, LEAD	5
812244		EARTH LUG 3ϕ	1
812245		LEAD WIRE	1 SET
812246		SCREW	1 SET
812247		INDIVIDUAL CARTON BOX	1
812248		SNOW BOX	1 SET
812249		INSTRUCTION MANUAL	1
265199		TENSAI CERTIFICATE	1
812251		RATING LABEL	1
812252		CONNECTION CABLE	1
812253		POLY BAG	1

MECHANISM PARTS

PARTS NO.	REF. NO.	DESCRIPTION	Q'TY
PBD 0566	1	CHASSIS ASS'Y	1
PBD 0611	2	SIDE PLATE L ASS'Y	1
PBD 0642	3	SIDE PLATE R ASS'Y	1
PBE 14073	4	LINK PLATE B	1
PBE 14084	5	SPRING	1
PBE 14074	6	LINK PLATE C	1
PBE 01190	7	LINK PLATE A ASS'Y	1
PBE 14092	8	SWITCH PLATE	1
AH 2522	9	MICRO SWITCH	1
PBE 13722	10	CASSETTE HOLDER	1
PBE 01055	11	IDLER ASS'Y	1
PBE 14108	12	IDLER PLATE	1
PBE 14258	13	T SPRING	1
PBD 0538	14	TENSION ASS'Y	1
PBE 14337	15	IDLER GEAR	1
PBE 13640	16	C SPRING	1
PBE 01054	17	S REEL ASS'Y	1
PBE 01129	18	T REEL ASS'Y	1
PBD 0570	19	HEAD BASE ASS'Y	1
PBE 01191	20	PINCH ARM ASS'Y	1
PBE 14081	21	PINCH ARM SPRING	1
PBE 14066	22	COLLAR	1
PBE 14082	23	SPRING	1
PBE 01192	24	SHAFT HOLDER ASS'Y	1
PBE 13507	25	EARTH PLATE	1
PBE 14107	26	INTER LEVER	1
PBE 14090	27	SPRING	1
PBE 14067	28	COLLAR	2
PBC 1077	29	INTER LOCK	1
PBE 14091	30	T SPRING	1
PBD 1550	31	FLYWHEEL	1
PBE 13023	32	C SPRING	1
PBE 14031	33	BELT	1
PBE 14032	34	BELT	1
PBE 01441	35	FLYWHEEL HOLDER ASS'Y	1
PBE 13497	36	CAPSTAN SUPPORT	1
PBE 13880	37	WASHER	1
PGWF30A080050	38	WASHER	1
PGWM16X040020	39	WAHER	2
PGWF30A060050	40	WASHER	2
	41		
PBE 14114	42	TUBE	1
PBE 14272	43	BRAKE PLATE	1
PBE 14180	44	BRAKE CR	1
PBE 6007	45	SPRING	1
PBE 11077	50	HEAD STAND	1
PBE 13666	51	C SPRING	1
H2331	52	P/R HEAD	1
H53201	53	ERASE HEAD	1
PBD 14075	54	MOTOR BRACKET	1
EG510ED2B	55	MOTOR	1
PBE 14034	56	MOTOR PULLEY	1
PBE 3883	57	SOLENOID	2
PBE 2882	58	SOLENOID	1
	59		
PBE 13936	60	BELT	1
PBE 01196	61	BACK PLATE ASS'Y	1
PBD 0638	62	LOADING CASE ASS'Y	1
PBE 14106	63	LINK	2
PBE 14121	64	COLLAR	1
PBE 13394	65	COLLAR	1
PBE 14089	66	SPRING	1
PBE 14105	67	EJECT LEVER	1
PBE 14088	68	SPRING	1
PBE 01374	69	CYLINDER ASS'Y	1
PBE 14070	70	LEVER	1
PBE 14195	71	SWITCH PLATE	1
MSW 0094	72	LEAF SWITCH	1
	73		
PBE 12929	74	T SPRING	1
PBE 13261	75	LAG	1
PBE 13794	76	LAG	2
PBE 14271	77	CR. TUBE	1
PGSN20A2015	101	B SCREW M2x15, head(2)	2
PGSP20A2012	102	B SCREW M2x12	
PGSN20A2012	103	B SCREW M2x12, head(2)	2
GSP10A2603	104	SCREW M2.6x3, Motor(2)	2
PGSP10A2010	105	SCREW M2x10, micro switch(2)	2
PGSD10A2605	106	DT SCREW M2.6x5, FW(3) Motor(3) Idlerplate(1)cassette SW(3) Eackplate(2)	13
PGSD10A2606	107	DT SCREW M2.6x6 collar(2)	2
PGST15A2606	108	F TAPPING SCREW holder(1) M2.6x6 cylinder(1)	2
PGSD10A2610	109	DT SCREW M2.6x10 holder(3)	3
PGSP30A2612	110	K SCREW M26x12 collar(1)	1
PGSD10A3005	111	DT SCREW M3x5 side plate(4),cylinder(1)	5
PGSP20A3004	112	B SCREW M3x4 SOLENOID(6)	6
PGST10A3010	113	TAPPING SCREW, case(1) M3x10	1
PGST10A2610	114	TAPPING SCREW, case(1) M2.6x10	1
PGSS01A2003	115	SCREW M2x3, pulley(1)	1
PGRS30P	116	CS RING CS-3,link plate(1)	1
	117		
PGRE25A	118	E RING E-2.5 Link plate(2) Head(1) EJECT lever(1)	5
PGRE30A	119	E RING E-3, Link(4) lever	4
PGRE40A	120	E RING E-4, Pinch arm(1) Tension(1)	2

ASSEMBLING HARDWARE CODING LIST

a — Pan Head Screw PAN M3x4
b — " PAN M3x6
c — " PAN M3x12
d — Binding screw M3x4
e — PAN HEAD SCREW M4x8 WITH FLAT WASHER
f — Binding Screw PAN 3x6
g — " PAN 3x8 WITH FLAT WASHER
h — " PAN 3x8
i — " PAN 3x8 WITH FLAT WASHER
j — " PAN 3x14
k — LOCK WASHER 3ϕ
m — WASHER 3ϕ x 6ϕ Black
n — NUT M3
p — Push RIVET
o — Lug 3ϕ
r — FLAT WASHER 3.5ϕ x 9ϕ
s — GROUND KNOB NUT
t — SCREW M4x8 WITH FLAT WASHER BLACK
u — SCREW M3x8
v — Binding Screw 2.6 x 6
w — LOCK NUT M4
x — FLAT WASHER 3ϕ
y — FLAT WASHER 4ϕ x 10ϕ BLACK
z — Binding Screw 3x10